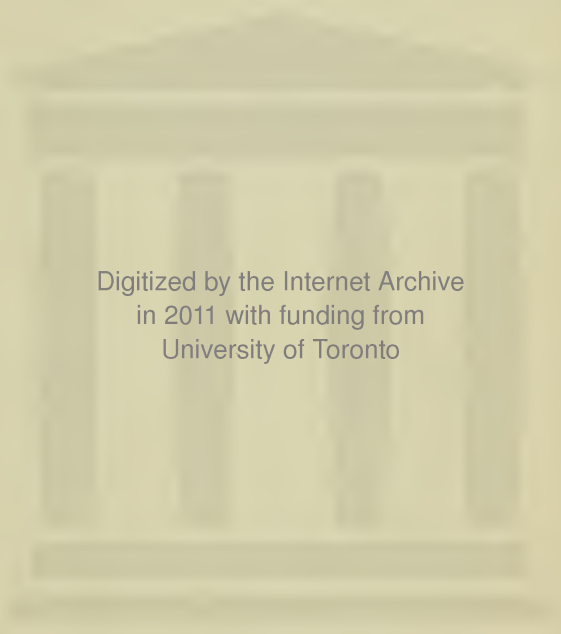


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DENTAL

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MATERIA MEDICA.

COMPILED BY JAMES W. WHITE.

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PREFACE.

THE frequent receipt of letters asking information as to the properties, dental uses, and methods of applying the various medicinal agents and preparations advertised for sale, or alluded to in the discussions of dental societies and by correspondents in the journals, has made it desirable to prepare something as a ready answer to such inquiries.

The natural, botanical, and chemical history of the articles noticed has not been attempted, because it was not thought advisable to swell the volume by details which, if desired, are easily obtained elsewhere; nor, for obvious reasons, have their applications in systemic treatment been included.

No effort has been made to give original ideas, but simply to collect from reliable authorities a list of remedies in frequent use by the pro-

fession, and the indications for their employment in dentistry. And in this connection, the cordial co-operation of gentlemen from whom information and suggestions have been asked, is gratefully acknowledged.

The graduates of dental colleges, and those who have ready access to the numerous authorities in medical and dental literature, will not of course expect to find anything new in these pages; nor is it probable that the indicated applications of the various remedies will meet the approval of all; but the aim has been, by a comparison of authorities and the criticisms of leading men in the profession, to make the volume, so far as it goes, convenient, useful, and reliable.

It is our intention to revise the book, from time to time, with such additions and modifications as may be suggested or considered necessary to supply existing deficiencies; and we invite from those who feel interested in the diffusion of knowledge useful to the profession, the communication of friendly suggestions and criticisms.

PHILADELPHIA, July, 1868.

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DEFINITIONS

OF

TERMS DENOTING THE

PROPERTIES OF REMEDIAL AGENTS.

ABSORBENT.—Neutralizing acid or irritant substances in the stomach or bowels.

ALEXIPHARMIC.—Antidotal to poison.

ALTERATIVE.—Promoting healthy organic transformations.

ANÆSTHETIC.—Having the power of producing insensibility to pain.

ANAPHRODISIAC (*Antaphrodisiac*).—Subduing the sexual passion.

ANODYNE.—Allaying pain.

ANTACID.—Counteractive of acidity.

ANTHELMINTIC.—Destroying or expelling worms.

ANTIARTHRITIC.—Relieving gout.

ANTILITHIC.—Tending to cure stone and gravel.

ANTIPERIODIC.—Preventing the recurrence of periodic diseases.

ANTIPHLOGISTIC.—Diminishing fever and inflammation.

ANTISCORBUTIC.—Curing or preventing scurvy.

ANTISCROFULIC.—Tending to prevent and cure scrofula.

ANTISEPTIC.—Counteracting a putrescent tendency.

ANTISPASMODIC.—Allaying spasms.

ANTISYPHILITIC.—Overcoming venereal diseases.

ANTITOXIC.—Antidoting poison.

ANTIZYMOTIC.—Curing diseases caused by a virus operating like leaven.

APERIENT.—Gently laxative.

APHRODISIAC.—Exciting the sexual passion.

ASTRINGENT.—Contracting organic texture

CARMINATIVE.—Correcting flatulency.

- CATHARTIC.—Producing evacuations from the bowels.
- CAUTERANT.—Searing or destroying flesh.
- CHOLAGOGUE.—Producing bilious stools.
- CORROBORANT.—Strengthening, or giving strength.
- COUNTER-IRRITANT.—An irritant applied to one part to relieve disease in another part.
- DEMULCENT.—Soothing.
- DEOBSTRUENT.—Removing obstructions.
- DEPILATORY.—Removing hair.
- DEPURATIVE.—Removing impurities from the fluids of the body.
- DERIVATIVE.—Diverting from one part to another.
- DESICCANT.—Drying up moisture or humors.
- DETERGENT.—Removing impurities, cleansing.
- DIAPHORETIC.—Producing perspiration.
- DILUENT.—A drink which simply dilutes the various liquids of the body.
- DISCUTIENT.—Dispersing or repelling morbid swellings.
- DIURETIC.—Increasing the secretion of urine.
- DISINFECTANT.—Destroying the causes of infection.
- DRASTIC.—Powerful, applied to purgative medicines.
- ECBOLIC.—Inducing abortion.
- ECTROTIC.—Causing abortion; destroying morbid action.
- ELIMINANT.—Producing a discharge of morbid substance from a particular organ.
- EMETIC.—Causing vomiting.
- EMOLLIENT.—Softening, soothing.
- EMMENAGOGUE.—Promoting menstruation.
- EPISPASTIC.—Irritating, blistering.
- ERRHINE.—Exciting nasal discharges.
- ESCHAROTIC.—Searing or destroying flesh.
- EVACUANT.—Producing a discharge from a particular organ.
- EXPECTORANT.—Promoting mucous discharges from the air-passages.
- FEBRIFUGE.—Allaying fever.
- GALACTAGOGUE.—Causing flow of milk.
- GALACTOPHORA.—Promoting secretion of milk.
- GALACTOPHYGA.—Preventing or checking the secretion of milk.
- HÆMOSTATIC.—Arresting the flow of blood.
- HEPATIC.—Promoting the healthful action of the liver.
- HYDRAGOGUE.—Producing watery stools.
- HYPNOTIC.—Inducing sleep or stupor.
- IRRITANT.—Exciting soreness and inflammation.

- LAXATIVE.**—Producing gentle action of the bowels.
- LENITIVE.**—Assuaging, palliating.
- LITHONTRIPTIC.**—Counteracting the formation of calculi.
- NARCOTIC.**—Inducing sleep or stupor.
- NERVINE.**—Nervous sedative.
- NUTRITIVE.**—Nourishing.
- PARTURIENT.**—Exciting parturition—childbirth.
- PECTORAL.**—Relieving diseases of the lungs.
- PROPHYLACTIC.**—Preventing disease.
- REFRIGERANT.**—Cooling, mitigating heat.
- RESOLVENT.**—Allaying inflammation and dispersing morbid swellings.
- RESTORATIVE.**—Bringing back the natural functions.
- REVELLENT.**—Diverting from one part to another.
- REVULSIVE.**—Acting by producing irritation in one part to divert diseased action from another.
- RUBEFACIENT.**—Exciting superficial irritation.
- SECRERNENT.**—Promoting the secretions.
- SEDATIVE.**—Diminishing vital actions.
- SIALAGOGUE.**—Stimulating the secretion of saliva.
- SORBEFACIENT.**—Promoting absorption.
- SOPORIFIC.**—Inducing sleep.
- SPASTIC.**—Producing involuntary muscular contraction.
- SPINANT.**—Acting upon the spinal marrow.
- STERNUTATORY.**—Exciting sneezing.
- STIMULANT.**—Exciting or increasing vital action.
- STOMACHIC.**—Inducing a healthful action of the stomach.
- STYPTIC.**—Arresting hemorrhage.
- SUDORIFIC.**—Causing sweating.
- SUPPURANT.**—Producing suppuration.
- TONIC.**—Producing a permanent increase in the tone or vigor of the system.
- VERMIFUGE.**—Destroying or expelling worms.
- VESICANT.**—Producing blisters.
- VULNERARY.**—Favoring the healing of wounds.

ABBREVIATIONS AND SYMBOLS USED IN PRESCRIPTIONS.

℥. Minim. One-sixtieth part of a fluidrachm.

Gtt. Gutta. A drop.

ʒj. Scrupulus. A scruple = 20 grains.

ʒj. Drachma. A drachm = 60 grains.

fʒj. Fluidrachma. A fluid or measured drachm.

ʒj. Uncia. A troyounce = 480 grains.

fʒj. Fluiduncia. A fluidounce.

℔j. Libra. A pound, understood in prescriptions to apply to an officinal pound of 5760 grains.

Oj. Octarius. A pint.

Cong. Congius. A gallon.

Gr. Granum. A grain; plural grana, grains.

Ss. Semis. Half; affixed to sigus as above.

The Latin numerals are employed in prescriptions—i, ij, iij, iv, v, vi, vij, viij, ix, x, xi, xij, xv, xx, xl, l, c, etc.

℞. Recipe. Take.

āā. Ana. Of each.

Ad libitum. At pleasure.

Aq. Aqua. Water.

Aq. Font. Aqua Fontis. Spring Water.

Aq. Bull. Aqua bulliens. Boiling Water.

Aq. Ferv. Aqua fervens. Hot Water.

Chart. Chartula. A small paper.

Coch. Cochlear. A spoonful.

Cort. Cortex. Bark.

Decoct. Decoctum. A decoction.

F. Fiat. Let it be made.

Fol. Folia. Leaves.

Flor. Flores. Flowers.

Garg. Gargarysma. A gargle.

Haust. Haustus. A draught.

Infus. Infusum. An infusion.

Liq. Liquor.

M. Misce. Mix.

Mass. Massa. A mass.
 Mist. Mistura. A mixture.
 Pil. Pilula. A pill.
 Pulv. Pulvis. A powder.
 Q. S. Quantum Sufficit. A sufficient quantity.
 Q. V. Quantum Vileris. As much as you wish.
 Rad. Radix. Root.
 Sem. Semen. Seed.
 S. Signa. Write.
 Solv. Solve. Dissolve.
 Spt. Spiritus. Spirit.
 Syr. Syrupus. Syrup.
 Tr. Tinct. Tinctura. Tincture.

WEIGHTS AND MEASURES.

The weights and measures used by physicians and apothecaries in the United States when prescribing and preparing medicines are the following:

APOTHECARIES' WEIGHTS.

These are derived from the Troy pound, and are exhibited in the following table, with their signs annexed. Troy weight corresponds with the apothecaries' weight in pounds, ounces, and grains, but differs from it in the division of the ounce, which, according to the former scale, contains twenty pennyweights, each weighing twenty-four grains.

Pound.	Troyounces.	Drachms.	Scruples.	Troy grains.
lb. 1 =	12	= 96	= 288	= 5760
	℥ 1 =	8	= 24	= 480
		ʒ 1 =	3	= 60
			ʒ 1 =	gr. 20

APOTHECARIES' MEASURES.

These are derived from the wine gallon, and are given in the following table, with their signs annexed:

Gallon.	Pints.	Fluidounces.	Fluidrachms.	Minims.	Cubic inches.
Cong. 1 =	8	= 128	= 1024	= 61440	= 231
	0 1 =	16	= 128	= 7680	= 28.875
		℥ 1 =	8	= 480	= 1.8047
			℥ 1 =	60	= .2256

RELATIVE VALUE OF
TROY AND AVOIRDUPOIS WEIGHTS.

Pound.		Pounds.		Pound.	Ounces.	Grains.	
1 Troy	=	0·822857	Avoirdupois	=	0	13	72·5
1 Avoirdupois	=	1·215277	Troy	=	1	2	280·

APPROXIMATE MEASUREMENT.

A <i>teacup</i> is estimated to contain about one gill or four fluidounces.				
A <i>wineglass</i>	"	"	"	two "
A <i>tablespoon</i> of liquid is estimated to contain				half a fluidounce.
" of powder	"	"	"	two drachms.
A <i>teaspoon</i> of liquid	"	"	"	one fluidrachm.
" of powder	"	"	"	half a drachm.
" of magnesia	"	"	"	about 10 grains.
A drop of water or watery fluids is equivalent to				one minim.
" oils and tinctures	"	"	"	about $\frac{1}{2}$ minim.
" chloroform	"	"	"	about $\frac{1}{3}$ "

TABLE OF THE NUMBER OF DROPS OF DIFFERENT LIQUIDS
EQUIVALENT TO fʒj.

Acetum opii	90	Chloroformum	180	Ol. olivæ	76
Acid. aceticum dil.	55	Ext. valerianæ Fld.	115	" tiglli	80
" hydrocyanicum dil.	52	Ether sulphuric	150	Spiritus æth. nit.	90
" muriaticum	54	Glycerina	55	" " comp.	90
" nitricum dil.	62	Liq. ammoniæ	49	Tr. aconiti rad.	118
" sulphuricum dil.	54	" iod. comp.	75	" ferri chlor.	132
" " aromat.	116	" arsen. ethyd. iod.	52	" opii	120
Alcohol	118	" potassæ arsen.	60	" " camph.	75
" dil.	98	Ol. gaultheriæ	102	Vinum antimonii	62
Aqua	64	" menthæ pip.	103	" opii.	78
		" " vir.	89		

TABLE OF THE NEW FRENCH DECIMAL OR METRICAL WEIGHTS COMPARED WITH AVOIRDUPOIS AND APOTHECARY WEIGHTS.

The decimal subdivisions of the *Metre*, *Litre*, and *Gramme* are expressed by the Latin prefixes, *deci*, *centi*, *mili*, etc.; while the decimal multiples are expressed by the Greek prefixes, *deca*, *hecto*, *kilo*, etc.

The *metre*, or unit of length, at 32° C. = 39·371 English inches at 62° F.
 The *litre*, or unit of capacity, = 61·028 English cubic inches.
 The *gramme*, or unit of weight, = 15·434 Troy grains.

Names.	Equivalent in Grammes.	Equivalent in Grains.	Equivalent in Avoirdupois weight.	Equivalent in Apothecaries' weight.
Milligramme ..	·001	·0154	lb. oz. gr.	lb. oz. dr. gr.
Centigramme ..	·01	·1543		·1
Decigramme ..	·1	1·5434		1·5
Gramme	1·	15·4340		15·4
Decagramme ..	10·	154·3402	0¼ 45·	2 34·
Hectogramme ..	100·	1543·4023	3½ 12·152	3 1 43·
Kilogramme...	1000·	15434·0234	2 3¼ 12·173	2 8 1 14·
Myriagramme .	10000·	154340·2344	22 0¼ 12·	26 9 4 20·

THE PULSE AT VARIOUS AGES.

	No. of pulsations per minute.
At birth	130 to 150
One year	108 to 130
Seven years	72 to 90
Puberty	80 to 85
Adult age	70 to 75
Old age	50 to 65

RESPIRATION AT VARIOUS AGES.

	No. of respirations per minute.
First year	35
Second year	25
At puberty	20
Adult age	18

ERUPTION OF THE TEETH.

DECIDUOUS TEETH.

(The lower generally precede the upper by two or three months.)

Central incisors	5 to 8 months.
Lateral "	7 to 10 "
1st molars	12 to 16 "
Canines	15 to 20 "
2d molars	20 to 36 "

PERMANENT TEETH.

1st molars	5 to 6 years.
Central incisors	6 to 8 "
Lateral "	7 to 9 "
1st bicuspid	9 to 10 "
2d "	10 to 11 "
Canines	11 to 12 "
2d molars	12 to 14 "
3d "	17 to 21 "

DENTAL MATERIA MEDICA.

PRECIPITATED CHALK.

Calcis Carbonas Præcipitata.

THIS is a valuable remedy in the hands of the dentist as a dentifrice, a polishing powder for fillings, and for laboratory use. Also as a corrector of acidity of the mouth, when rubbed between the teeth in large quantity and allowed to remain over night.

It is a good agent for obtunding sensitive dentine, when faithfully applied sufficiently often for a few days, facilitating excavations of cavities that otherwise would be tedious to the operator and painful to the patient.

For young patients, when indicated, it is especially applicable. It will be well to supply a good article to the patient, with instructions how to use it, in order to secure the best results. Depositions of calculus contraindicate its use.

Precipitated chalk is prescribed in cases of poisoning by oxalic acid, and the vegetable and mineral acids generally.

LIME-WATER.

Liquor Calcis.

This solution is made by adding cold water to freshly slaked lime; kept in a well-stopped bottle, with the undissolved lime; the clear liquor poured off when wanted for use.

It is antacid, antiseptic, detergent, astringent, and gently styptic.

Recommended as a mouth-wash in full strength, or diluted to suit the case, for viscid and fetid mucous secretions; where the gelatinous tissue of the teeth is in excess of the lime salts; where there is abnormal sensitiveness of the substance of the teeth, either in exposed dentine or denuded roots, and as an antacid to prevent the action of acid remedies upon the teeth. In those cases where there is evident tendency to rapid disintegration of tooth structure, from a deficiency of the earthy constituents, its habitual daily use as a mouth-wash is attended with beneficial results.

Its unpleasant alkaline taste can be disguised by the addition of a small quantity of bruised liquorice root and coriander seeds.

SPIRIT OF AMMONIA.

Spiritus Ammoniaë.

Stimulant, antacid, antispasmodic. Useful in hysteria, syncope, asphyxia, etc., either inhaled by the nostrils or administered internally. Dose, 10 to 30 drops in a wineglassful of water.

It dissolves resins, gum resins, camphor, and the volatile oils. It is a convenient addition to spirituous liniments intended to produce a rubefacient effect. Not more than 1 part of the spirit should, as a general rule, be added to 6 or 8 parts, by measure, of the liniment.

It is a convenient and efficient remedy used (by the addition of a few drops to a tumblerful of water) on the brush, or as a mouth-wash, when the use of an antacid remedy is indicated.

There is an officinal aromatic spirit of ammonia (*Spiritus Ammoniaë Aromaticus*), fitted to fulfill the same indications, and more used on account of its grateful taste and smell. The dose of this preparation is from 30 drops to a fluidrachm, sufficiently diluted with water.

SANDARAC VARNISH.

For temporary stoppings over creasote dressing and creasote and mercury applied to aching teeth,

this is convenient and efficient. After neatly inserting the remedy, a pledget of cotton, just large enough to fill the cavity, should be saturated with thick varnish and gently packed upon the dressing.

It has also been used to protect temporarily fillings of oxychloride of zinc from the fluids of the mouth, but for this purpose is inferior to the "Solution of Gutta-percha" (which see).

Equal parts of sandarac and gum benzoin make a good varnish with alcohol, which has a very agreeable odor and taste when fresh, resembling vanilla.

Sandarac is useful in the laboratory to varnish models, to prevent the hands from becoming soiled by the plaster in handling them, and also to insure a better parting from the sand in moulding. Where it is desirable to make a very hard surface to the model, take some of the varnish and dilute it with alcohol to make it more penetrating, and apply several coats, until a smooth surface is obtained; by this treatment of a model made of good plaster, which has been properly mixed, a very hard surface can be secured.

Shellac varnish is used by some for the same purposes; it makes a tougher film on the face of the model, is more viscid, and consequently does not penetrate the plaster as much as the sandarac, and therefore does not give as great solidity to the

face of the model, and on account of its brownish color presents a less sightly appearance. In case the varnish becomes too thick, add a little alcohol to bring it to the desired consistence.

M E R C U R Y.

Hydrargyrum.

Mercury, in its metallic form, redistilled to insure freedom from foreign impurities, is employed in the preparation of amalgams for filling. The usual directions for its use are to put into a small wedgewood or glass mortar the quantity of mercury and so much of the filings as may be required for the time, and with the pestle rub the contents into a stiff paste; add a spoonful of alcohol, and continue the rubbing until the liquid becomes quite dark; then pour it off and remove the amalgam to a dry cloth, with which completely absorb the moisture; press out the superabundant mercury by twisting the mass in a piece of chamois-skin or stout muslin, and by pressure with large flat-nosed pliers, or by any other means preferred, and it is ready for use. Others direct it to be worked in the palm of the hand, or in a small mortar, adding bicarbonate of soda in powder, or common salt, and washing with water, repeating the process until the mass is

thoroughly cleansed and free from coloring matter. It has been suggested that in washing with alcohol the addition of a few drops of a strong solution of chloride of zinc is advantageous.

A neat little arrangement has been devised for the convenient use of mercury, called a *Mercury Holder*. It consists of a small bottle-shaped case of hard wood divided into two parts by a screw at the neck where it is opened to receive the mercury; a small perforation through the stem opening at the mouth of the bottle allows the mercury to escape in a very fine stream, which can be regulated at pleasure.

Mercury is also employed in the removal of amalgam fillings, applied by means of a suitable instrument with a *silver* point. The silver having been scraped bright, is dipped into the mercury and applied to the filling. The affinity of the mercury for the silver causes a portion of it to adhere to the instrument, but on coming in contact with the amalgam this affinity is overcome, and it unites with the filling, reducing it to a plastic condition, and allowing its easy removal. It is the custom with some to drill a small cavity into the filling, and place a globule of mercury in it, which soon softens the entire mass.

OIL OF GAULTHERIA.

Oleum Gaultheriæ.

This oil is prepared from the leaves of a plant variously called partridge-berry, tea-berry, or winter-green.

It is aromatic, stimulant, and astringent. Used, chiefly on account of its pleasant flavor, as an ingredient of mouth-washes.

SOAP BARK.

Quillaya Saponaria.

The name of this plant is derived from the fact that it imparts to water the property of forming a lather when agitated, like a solution of soap.

An alcoholic tincture is frequently used as an ingredient of mouth-washes. An excess produces a very acrid, unpleasant taste, with a sense of constriction in the throat.

SAGE.

Salvia.

Used frequently in country practice as a mouth-wash and gargle in the form of infusion; an ounce of the leaves to a pint of boiling water, to which honey and alum or vinegar is added.

It is pleasant to the taste, inexpensive, can frequently be procured where other astringents are not so easily obtained, and is really an efficient preparation.

SUMACH.

Rhus Glabrum.

Of this genus there are several species possessing poisonous properties, which should be carefully distinguished from that used in medicine. The one here noticed is variously called smooth sumach, Pennsylvania sumach, and upland sumach.

The berries have a sour, astringent, not unpleasant taste; the astringency depending upon tannic and gallic acids.

The infusion of the berries, an ounce to a pint of boiling water, makes a pleasant and efficient gargle in inflammation and ulceration of the throat, and in threatened tonsillitis has proven exceedingly valuable. Alum is sometimes added to the infusion.

An infusion of the inner bark of the root has been asserted to be almost a specific in the sore mouth attending mercurial salivation.

BORAX.

Sodæ Boras.

Refrigerant and detergent. Much employed in aphthous affections of the mouth in children; applied in powder, either mixed with sugar in the proportion of one part to seven, or rubbed up with honey in the proportion of 1 drachm of borax to an ounce of honey. For adults it is frequently prescribed with an equal quantity of sugar.

A case of inveterate cracked tongue is reported to have been cured by a lotion composed of 2 scruples of borax in an ounce of glycerin and 4 ounces of water. Borax is frequently added to gargles of sage, balm, etc.

To harden plaster, thoroughly dry the cast, and then immerse it for a few minutes in a solution of borax in boiling water. When cool it will be found to be extremely hard.

ALUM.

Alumen.

A solution containing from half an ounce to an ounce in a pint of water, and sweetened with honey, is an efficient gargle in relaxation of the uvula and inflammation of the mucous mem-

branes, and as an astringent wash in mercurial sore mouth. Used also as a styptic in hemorrhage from the socket of an extracted tooth and from leech bites.

As a styptic, it may be used in powder or saturated solution, preferably warm, and retained in place until the bleeding vessels have contracted.

There is an officinal iron alum (*Ferri et Ammonix Sulphas*) which is more astringent than common alum, and prescribed in similar conditions. The tersulphate of alumina (*Aluminæ Sulphas*) is an astringent and antiseptic, useful as an application to ulcers, and where a stimulating astringent and antiseptic effect is desired. It is more agreeable to the taste than alum. In solution with chlorate of potassa, it affords an excellent wash and gargle for many affections of the throat and tonsils. As a gargle, it is used in the strength of 1 drachm to 4 ounces of water.

These salts are peculiarly applicable to the healing of wounded and inflamed *edentulous* mouths, but are contraindicated in mouths where teeth are present, in consequence of the injurious action of the free sulphuric acid upon these organs. The objection does not of course apply to their occasional use as gargles in diseased conditions with as much force as to the habitual use of alum as an

ingredient of tooth powders, for which purpose it has been recommended. Burnt alum is sometimes used as an escharotic for destroying fungous flesh.

Alum is a prompt and safe emetic in the dose of from 2 to 4 drachms mixed with syrup or molasses.

NITRATE OF POTASSA.

Potassæ Nitræs.

Antiseptic and refrigerant. It has been recommended in threatened alveolar abscess, the pulp cavity of the tooth being filled with the powdered salt, which is protected from being dissolved by the fluids of the mouth, by cotton and wax or sandarac varnish.

It is a useful ingredient of gargles in certain stages of inflammatory sore throat, in the strength of from 2 to 4 drachms to the pint of water.

CHLORATE OF POTASSA.

Potassæ Chloras.

A resolvent and detergent; employed in ulcerative and gangrenous stomatitis of infants, and mercurial and maternal stomatitis. Externally, in solution, it has been found useful as an application to indolent and serofulous ulcers and phagedæna, to ulcerations of the nose, mouth, and

throat, and for cleansing cancerous sores. When used as a gargle, from a drachm to half an ounce of the salt may be dissolved in a pint of water. A solution of 1 part to 10 parts of glycerin has been recommended as a dressing for ill-conditioned ulcers and wounds. As a gargle, it is frequently used in combination with tannin. A valuable combination for a mouth-wash and gargle in inflamed conditions is 1 drachm each of chlorate of potassa and sulphate of alumina to 4 ounces of water. It has also been recommended as a mouth-wash in gingivitis, in combination with borax; 1 drachm of each to 2 ounces of water. Lozenges made of this salt are frequently prescribed for aphthous ulcers of the mouth and throat. This salt requires sixteen times its weight of water for its solution. *Chlorate of soda* has the advantage over the corresponding potash salt of greater solubility, dissolving in three parts of water.

HYPOSULPHITE OF SODA.—*Sodæ Hyposulphis.*

SULPHITE OF SODA.—*Sodæ Sulphis.*

BISULPHITE OF SODA.—*Sodæ Bisulphis.*

These remedies have come into general use in consequence of their extraordinary powers in destroying the life of lower organic beings. They are exceedingly valuable in that species of aphthous

sore mouth which is attributed to a parasitic vegetable. The acid secretions of the mouth liberate the sulphurous acid, which kills the parasite. The solution in these cases acts with surprising rapidity, a single application of it sometimes removing the disease in twenty-four hours.

In diphtheritic conditions of the mouth and throat they form an excellent gargle. A saturated solution has been recommended for office use, to cleanse the hands after operating.

As a mouth-wash and gargle, the strength may be a drachm of either of the preparations to an ounce of water, which can be subsequently diluted if unpleasantly strong. For aphthous ulcers, depending on vegetable parasitic formations and diphtheritic depositions on the mucous membranes, as well as a prophylactic to the operator, these remedies, in the form of lozenge, are very efficient. The taste may be disguised by combining them with liquorice.

As the bisulphite contains, as its name implies, two equivalents of sulphurous acid, it is to be preferred for mouth-washes and gargles on account of its easier decomposition and the freer liberation of the acid when coming in contact with the secretions of the mouth. A strong solution of either of these salts is convenient for removing the stains of iodine. Bisulphite of soda in large

doses is highly recommended in the treatment of the constitutional effects resulting from poisoned wounds.

PERMANGANATE OF POTASSA.

Potassæ Permanganas.

A powerful disinfectant; by some considered superior to all others. It has an extraordinary power of destroying fetid odors from organic sources. It has been used successfully in the treatment of fetid and gangrenous ulcers, abscesses, and wounds of all kinds, of fetid discharges from the mucous membranes, and of diphtheritic affections; also as an antiseptic for the canals of teeth in which the pulp has become devitalized.

It is applied to the diseased surface in solutions of various strength. In concentrated solution it is capable of acting as a caustic, and therefore requires caution. A small quantity of the powdered crystals has been recommended for the cure of odontalgia, applied to the cavity of decay. As a gargle in unhealthy ulcers of the mouth and fauces, with offensive breath, it may be used in the strength of from 1 to 4 scruples to the pint of water. The stains of permanganate of potassa may be removed by dilute muriatic acid.

CHLORINATED LIME.

Calx Chlorinata.

Stimulant, astringent, and disinfectant. Has been used with advantage in solution as a gargle in putrid sore throat, and as a wash for the mouth to disinfect the breath, and for ulcerated gums; but its unpleasant taste and odor forbid its use in a great majority of cases. It has also been used for cleansing the canals in teeth whose pulps have suppurated, and for bleaching discolored teeth. Care should be taken by plugging the canal to prevent the chlorine from escaping at the apical foramen. Its efficiency depends altogether upon its chlorine, which, being loosely combined, is disengaged by the slightest affinities, and a solution of tartaric, citric, or acetic acid, of the strength of common vinegar, has been recommended for this purpose. A pledget of cotton saturated with the solution, dipped in the powder, should be applied quickly to the cavity, which must be immediately sealed with cotton and wax or sandarac varnish. Repeated applications extending over several days may be necessary before the bleaching is satisfactory. As a gargle and mouth-wash, the strength may be about 2 drachms to the pint of water; it should be filtered before using.

SOLUTION OF CHLORINATED SODA.

(*Labarraque's Disinfecting Liquid.*)

Liquor Sodæ Chlorinata.

Stimulant and antiseptic. As a local remedy it has been found useful in those affections attended with fetor, such as gangrenous, cancerous, scrofulous and syphilitic ulcers, ulcerations of the gums, putrid sore throat, etc.

In the sloughing of the fauces, occurring in severe cases of scarlatina, it has been highly recommended as a gargle. In the sore mouth from ptyalism, it forms a good mouth-wash, diluted with from 8 to 16 volumes of water.

The solution has also been used for bleaching discolored teeth. The caution given in reference to the use of chlorinated lime for this purpose applies also to this solution. It should be kept in a well-stopped bottle, in a cool and dark place.

GLYCERIN.

Glycerina.

The uses of glycerin as a solvent and vehicle of other medicines are too numerous to mention. It is soluble in all proportions in water and alcohol. It dissolves bromine, iodine, bromide of

potassium, iodide of potassium, creasote, carbolic acid, quinia, tannin, morphia, strychnia, etc.

An excellent application for use, in certain morbid conditions of the mouth, is borax 2 drachms, glycerin 1 fluidounce. For aphthous ulcers, an admirable application is sulphite of soda 1 drachm, glycerin 1 fluidounce.

ALCOHOL.

Spiritus Rectificatus.

There are three officinal varieties of alcohol of different strengths:

Alcohol, of the strength of 85 per cent.; sold in the apothecary shops where no qualifying word is used in the prescription.

Diluted alcohol (*Alcohol Dilutum*), of the strength of 39 per cent.; formed by the mixture of alcohol with an equal quantity of distilled water.

Stronger alcohol (*Alcohol Fortius*), of the strength of 92 per cent., commonly sold as 95.

The diluted alcohol is used in the manufacture of many of the officinal tinctures. Beside these, there is the anhydrous or absolute alcohol, not officinal, but directed in some formulas, as for instance, in the preparation of the strong tincture of iodine.

Alcohol is recommended as an efficient and re-

liable agent for the cleansing of pulp cavities and canals containing disintegrated pulps. Used by dropping it into the cavity and gently working fine probes into the canals. When it becomes turbid the cavity should be washed out with water, dried, and the application renewed until it remains clear.

Alcohol is employed as the solvent of many articles used in dental practice, and for heating purposes, while soldering, annealing foil, etc.

CAMPBOR.

Camphora.

A saturated solution of camphor in chloroform (in which it is extremely soluble) is an efficient remedy in allaying the extreme suffering induced by extraction of a tooth during severe periostitis; apply on a pledget of cotton to the alveolar socket.

Oil of camphor has a persistent, penetrating, fragrant odor, and a pungent taste, possessing considerable influence as an anodyne narcotic and refrigerant. In treating diseased teeth, where there has been periosteal trouble or a dead and offensive pulp, it will be found very useful when a patient's idiosyncrasy is such as to prohibit the use of creasote.

Creasote is thought by some to be deprived of much of its offensive odor by combination with camphor, in the proportion of 20 grains to the ounce of creasote. It is said to modify the escharotic power of creasote without impairing its antiseptic qualities: others assert that it is productive of pain and irritation.

OIL OF TURPENTINE.

Oleum Terebinthinae.

The use of this remedy in the treatment of odontalgia has been long known, and has with many been a favorite application to relieve pain resulting from inflamed pulps; but other remedies have now almost entirely superseded it. It has the advantage of being within the reach of all, and is not liable to produce the unpleasant effects that often follow the too free use of chloroform and creasote, while the beneficial results in many cases are as satisfactory.

As an application to reduce inflammatory conditions that frequently follow the removal of pulp, it has been found very useful.

WINE OF OPIUM.

Vinum Opii.

Is a very convenient form of this narcotic remedy for application in the mouth. It is soothing to tender gums, quieting to aching teeth, but above all useful in ulcerous patches on the gums or mucous membrane, from whatever source they may arise. As an injection in abscesses of the oral cavity, by means of a subcutaneous syringe, it is invaluable as a palliative and curative remedy. Used generally after or in alternation with tincture of iodine, after pus has been nearly or quite prevented from forming.

The wine of opium is made by macerating 2 ounces of powdered opium, together with cinnamon and cloves, in 1 pint of white wine. *Tinctura Opii (laudanum)* is made by macerating $1\frac{1}{4}$ ounces of powdered opium in 1 pint of diluted alcohol (equal parts of alcohol and distilled water).

For the treatment in cases of poisoning by the preparations of opium, see "Acetate of Morphia."

TINCTURE OF ARNICA.

Tinctura Arnicæ.

The especial use of this remedy is to prevent suppuration and ecchymosis in fresh bruises and ragged wounds. It should be applied directly to the part, on pledgets of cotton, in full strength, to secure its happiest effects. When largely diluted with water, it makes an admirable mouth-wash, for use while performing operations. In combination with an equal quantity of glycerin, it makes a very pleasant application for external use to abraded surfaces, etc. To prevent ecchymosis, it is frequently prescribed in combination with an equal quantity of a solution of muriate of ammonia, made by the addition of a half ounce of the salt to 5 ounces of water.

TINCTURE OF CALENDULA.

Tinctura Calendulæ.

This is a capital application to all fresh incised wounds, either in full strength or in various degrees of dilution, applied on cotton, directly over the broken surface. It prevents inflammatory degeneration, and promotes union by first intention. Used after extracting roots and removal of foreign

deposits from the teeth. A few drops to a goblet of water, as a mouth-wash, is very comforting to the patient when undergoing the operation of the removal of salivary calculus from the teeth.

TINCTURE OF MYRRH.

Tinctura Myrrhæ.

A stimulant tonic. Used, diluted with water, as a wash for spongy gums, aphthous sore mouth, ulcerations of the throat, and as an injection into the antrum in conditions requiring a mild stimulant application. Its use as a mouth-wash may be considered questionable, from the fact that the dilution of the tincture occasions a precipitation of the gum about the necks of the teeth, and thus tends to produce rather than alleviate the spongy condition of the gingival margins.

A pleasant paste for use in relaxed conditions of the mouth and throat is made by the addition of 1 drachm each of pulverized myrrh and alum to an ounce of conserve of roses.

TINCTURE OF WHITE-OAK BARK.

Tinctura Quercus Albæ.

An astringent and tonic. Useful, diluted according to the effect desired, in relaxed conditions of the mouth and fauces. There is an officinal decoction of white-oak bark, an ounce to the pint of water, which is frequently prescribed as a gargle.

TINCTURE OF CATECHU.

Tinctura Catechu.

A powerful astringent. Used, diluted with water, after extraction of teeth, and when an astringent effect is desired. It is apt to gelatinize when kept, and in this state is unfit to use. When diluted with water it does not form a clear solution, and is therefore not so pleasant to the eye as that made from kino or krameria.

TINCTURE OF KINO.

Tinctura Kino.

An astringent almost identical in its properties with catechu, and useful in the same conditions in which that remedy is indicated. Dr. Wood reports a case in which obstinate hemorrhage from a wound

in the palate, after resisting various means, yielded to the application of powdered kino, which was spread thickly on lint and pressed against the wound by the tongue.

The tincture, like that of catechu, has a tendency to gelatinize. It forms with water a clear solution, but is less pleasant to the taste, and perhaps less efficient than krameria.

TINCTURE OF KRAMERIA.

Tinctura Krameriae; Tincture of Rhatany.

Tonic and astringent. May be used in all the conditions in which kino and catechu are beneficial; but it has the advantage over kino in maintaining its medicinal properties for a great length of time; and over catechu, that it makes a beautifully clear mixture with water, while the flavor is superior to either.

Mixed with an equal quantity of good *eau de Cologne*, it makes a delightful mouth-wash, used diluted with water.

TINCTURE OF CAPSICUM.

Tinctura Capsici.

Recommended in cases in which active stimulation is desired, and is advantageous both as an application inside the mouth or externally upon the face, from the fact that it does not vesicate. Conjoined with equal parts of chloroform and alcohol, it makes probably the best application for the purpose of resolving chronic inflammatory products, as in chronic periodontitis, or of hastening suppuration in acute periodontitis.

To obtain its resolving effects, it should be applied moderately; for limiting and hastening suppuration, as frequently as can be endured. When so combined the vial containing it must be shaken before use to insure mixture.

It is used as a gargle in the strength of a half fluidounce to 8 fluidounces of rose-water, and is applied in its full strength by means of a camel's-hair pencil to the relaxed uvula.

It is recommended as a stimulant in cases of undue narcotic effects from belladonna, aconite, opium, etc.

TINCTURE OF ACONITE ROOT.

Tinctura Aconiti Radicis.

In the early stages of inflammation, aconite is a powerfully abortive remedy, when applied at the site of inflammatory action. It is supposed to act by paralyzing the nerves of the part, thus abolishing the incitement to the local afflux of blood, favoring resolution, and limiting the size of the abscess where pus is already formed. To mitigate the pain sometimes felt in the alveolus after the extraction of a tooth, a drop or two upon a pledget of cotton introduced into the socket will give immediate relief.

It is highly recommended as an application to an inflamed pulp; and is used, in combination with an equal quantity of chloroform, applied on a pledget of cotton, to benumb sensibility previous to extraction. *Care should be taken not to apply an excess*—from 5 to 10 drops being a full adult dose, when internally administered. It is a potent dressing in the canals of teeth, as a preventive to periodontal irritation. For this purpose, where so small a quantity can be applied, and powerful local effect is desired, a *saturated* tincture is used; but this is far too active for general use.

The officinal *liniment of aconite* is a very strong

tincture, intended only for external use, and requiring caution in its application to large surfaces, or where the skin is abraded, to prevent dangerous constitutional effects.

For local application, to benumb sensibility and prevent inflammation from progressing to suppuration, aconite is frequently prescribed in the form of the officinal solid extract (*Extractum Aconiti*) combined with Goulard's cerate (*Ceratum Plumbi Subacetatis*), in the strength of from 5 to 30 grains to the ounce, but care is required to prevent constitutional effects. *Belladonna* is used as an external application by some in the same conditions for which aconite is prescribed.

The treatment directed for an overdose of aconite or belladonna is prompt emetics, cinchona, galls or tannin in large doses, electro-magnetism, and active stimulation. Opium is generally considered a physiological antidote to belladonna, and forms also a part of the treatment advised in cases of poisoning by aconite.

SOLUTION OF GUTTA-PERCHA.

Liquor Gutta-Perchæ.

A solution of gutta-percha in chloroform; it is an excellent application for the temporary relief of odontalgia, and has also been used with advantage topically in cutaneous affections, ulcers, and as an ectrotic in small-pox.

For the relief of odontalgia, a drop of the solution is applied to the exposed pulp, the carious cavity having been previously cleansed of extraneous substances.

The chloroform in the solution evaporating, an impervious covering of gutta-percha remains over the exposed pulp. It is very useful as a covering to fillings of oxy-chloride of zinc, to protect the surface from the fluids of the mouth until they are sufficiently hard not to be injuriously affected by them.

It will often prove very useful in securing arsenical or other applications upon surfaces such as are frequently met with in the oral teeth of the middle aged, where pulp exposure follows mechanical abrasion. The medicine having been placed in position, the surface of the tooth should be carefully dried and covered with a piece of muslin dipped in the solution, and cautiously pro-

ected until the chloroform has entirely evaporated. Should antagonism endanger its retention, a guard may be used to obviate such result by preventing the closure of opposing teeth.

It is highly recommended as an application to abrasions, slight excoriations, etc., as a protective.

COLLODION.

Collodium.

A great advantage to be derived from the use of this remedy is in cases of alveolar abscess threatening to point externally, thus forming an unsightly scar.

It should be applied over the tumor by painting on successive layers, with a camel's-hair pencil, so as to act as a compress, and either induce resolution of the abscess or cause it to point into the mouth. It is also useful as a ready dressing for cuts. A piece of muslin should be *dipped into* the collodion and applied over the wound. Some smarting ensues, but the covering is strong, and not liable to be removed by washing. For a combination of collodion with perchloride of iron as a hæmostatic, see "Chloride of Iron."

A very useful combination for application to slight cases of superficial inflammation and ab-

rasion, is 5 drops castor oil to an ounce of collodion. This may be applied by the end of the finger or by means of a small brush to abrasions, slight excoriations, inflammation from friction, chaps on the lips or hands, and slight superficial wounds that have ceased bleeding. Should collodion become thick, a small quantity of ether and alcohol, in the proportion of three parts of the former to one of the latter, should be added.

The following directions for its use in vulcanite work have been given: Form the wax or gutta-percha plate on an unvarnished cast of the thickness desired for the mouth, making it smooth as possible. Run the female portion of the cast with care, to prevent bubbling in the plaster; separate the flask and paint the male model with the collodion. Carefully remove the wax or gutta-percha plate with the wax around the teeth, from the female model, so that the surface shall not be roughened or marred; then rub the surface perfectly smooth with a piece of muslin. Make the gates for the surplus material, and paint the entire surface with a thin coating of the collodion. Pack and heat the case in the ordinary way, using care not to mar the plaster model. After vulcanizing, polish the internal surface with brush-wheels; first with oil and rotten-stone, then with whiting and water.

An objection to collodion for this purpose is that it sometimes adheres to the rubber when vulcanized, giving it an unsightly appearance.

CANTHARIDAL COLLODION.

Collodium cum Cantharide.

A valuable remedy in periodontitis, applied to the gum about the root or tooth affected, by means of a camel's-hair brush or a portion of cotton upon an instrument; the gum having been previously carefully dried. The lip or cheek should be held away, and the moisture prevented from passing over the surface till the ether has evaporated and the artificial cuticle been formed. Within a few hours blistering occurs, and the periodontitis is effectually relieved. The patient should be directed to puncture the blister with a needle. A mixture of tincture of cantharides and collodion, in equal proportions, painted on the gum, is highly commended by those who have used it for the same purpose; it is not nearly so strong as the officinal preparation.

RESIN.

Resina.

Pulverized resin is a valuable styptic in alveolar hemorrhage following extraction, and has been used successfully after the more prominent remedies had failed. It should be applied on cotton or lint. As this agent may frequently be obtained where other styptics could not readily be procured, a knowledge of its efficiency might serve a useful purpose.

In this connection, it may not be amiss to allude to the hæmostatic properties of the charcoal obtained from cork by charring, subsequently pulverized, and applied in the same manner as directed for the resin.

TANNIN.

Acidum Tannicum.

A powerful astringent. Locally it may be used for all the purposes to which galls or other vegetable astringents are applicable; also for hemorrhages, relaxation of the uvula, chronic inflammation of the fauces, diphtheria, aphthæ, excessive salivation, flabby and phagedenic ulcers, etc. It has been recommended as an application in some

cases of sensitive dentine, and for this purpose is sometimes used in combination with morphia or creasote. It unites with albumen, fibrin, and gelatin, forming insoluble tannates, thus preserving the parts beneath from the influence of irritating agents till the case has time to terminate in resolution. It is soluble in water, alcohol, and glycerin; but the aqueous solution is liable to decompose when kept. An ointment may be made of it by rubbing two scruples first with twenty drops of glycerin and then with an ounce of lard. A solution in glycerin has been recommended as a powerful styptic, and an excellent local application in diseases of the mucous surfaces requiring an astringent impression. The solution is facilitated by a moderate heat.

One of the most useful and convenient preparations of tannin, and from which any other combination may be easily made, is prepared as follows: Tannin, 5 drachms; glycerin, 2 fluidrachms; *warm* a wedgewood mortar, and rub into a smooth paste. It should be kept in a wide-mouth bottle. In this condition it is of easy application on pellets of cotton. As a gargle for relaxed or enlarged uvula and tonsils, tannin may be advantageously used in combination with chlorate of potassa—a drachm of the former, 2 drachms of the latter, and an ounce of mel rosa to a pint of boiling water. In idiopathic hemorrhage

and sponginess of the gums it is very useful, either in the form of lotion or in fine powder sprinkled over the bleeding surfaces, and for hemorrhage from the socket of an extracted tooth it is one of the best remedies known; as an injection in some forms of disease in the antrum, it has proved useful in the strength of from 1 to 5 grains to the ounce of water.

Tannin in large doses, 20 or 25 times that of the poison taken, has been recommended in the treatment of poisoning by aconite, belladonna, stramonium, and the soluble salts of antimony.

ELIXIR OF VITRIOL AND TANNIN—Saturated Solution.

A powerful astringent and hæmostatic. Applied without dilution to bleeding surfaces, enlarged tonsils, etc.

STYPTIC COLLOID.

A new styptic and adhesive fluid. This is a saturated solution of tannin and gun-cotton in ether, highly recommended for its styptic, adhesive, and deodorizing properties. It can be applied directly with a brush, or, mixed with an

equal quantity of ether, in the form of spray. It solidifies blood or albumen by mere contact.

In treating the roof of the mouth for carious bone, or in plugging a bleeding alveolar cavity after extraction, it is excellent. No irritation follows its application, but rather a sedative effect. It combines nicely with various other agents, forming valuable compounds:

With creasote,	1 minim to 2 drachms.
“ carbolic acid,	2 “ to 2 “
“ quinia,	2 grains to 2 “
“ iodine,	5 “ to 2 “
“ iodide of cadmium,	7 “ to 2 “
“ morphia,	1 “ to 2 “
“ chloride of zinc,	7 “ to 2 “

To remove the dressing, a mixture of ether and alcohol may be used, or proof spirit warmed a little above the temperature of the body. Cold or warm water will not dissolve the styptic, and should not be employed.

MONSEL'S SALT.

Ferri Subsulphas.

A powerful astringent and styptic. Very efficacious in cases of hemorrhage from incised wounds, or surfaces in which it is desirable to avoid irritation. It may be applied clear or dissolved in water. There is danger of secondary hemorrhage from sloughing if applied too strong. It has been recommended as an application to sensitive dentine.

MONSEL'S SOLUTION.

Liquor Ferri Subsulphatis.

This is a solution of Monsel's powder, and is more convenient for some purposes than the powder, but possessing the same remedial properties. Applied on cotton to the bleeding surface in the hemorrhage following the extraction of a tooth, or for leech bites, it will usually arrest it in a few moments.

In the treatment of ulcers and abrasions of the mucous membranes from badly fitting plates or other causes; in slight wounds of the gums occurring during operations; in cases of inordinate secretion from the follicles of the gum at the necks of teeth; and in a variety of cases which will

readily present themselves to the reader, it is perhaps the most useful in dentistry of all the ferruginous preparations.

CHLORIDE OF IRON.

Ferri Chloridum; Sesquichloride of Iron; Perchloride of Iron.

A powerful astringent and styptic. Used in a semi-deliquesced state for arresting hemorrhage after excision of the tonsils and extraction of teeth.

It is used also as an application to bleeding surfaces, in various dilutions, from a half drachm to 6 drachms to the fluidounce of water. Its hæmostatic properties are said to be much increased by mixing it with an equal part of common salt dissolved in water. A hæmostatic for wounds, leech bites, etc., is directed to be made by adding gradually and carefully 1 part of the crystallized perchloride to 6 parts of collodion. The composition when well made is perfectly limpid, and produces on the skin a yellow pellicle which retains the elasticity of collodion film.

SOLUTION OF PERCHLORIDE OF IRON.

Liquor Ferri Perchloridi.

This is a solution of the perchloride; esteemed by some to be preferable to the crystallized, being more convenient for use. Its properties and applications are the same as the solid salt.

ACETATE OF MORPHIA.

Morphiæ Acetas.

This salt is regarded as possessing advantages over the sulphate for endermic applications, and is preferred in dental practice on account of its greater solubility, and an apparently greater chemical and mechanical compatibility with pulp tissue, often giving relief when the application of the sulphate only produces an exaggeration of suffering. It is preferred to the sulphate for these reasons, and because of its very much greater specific gravity, as an ingredient in the nerve powder or nerve paste in general use for the purpose of devitalizing the dental pulp.

It is obvious that, its specific gravity being nearer that of the arsenious acid, the paste will remain a more homogeneous mass than if the components differed more widely in this respect.

Opinions differ as to the rationale of its action in this combination—some considering it an obtunder of sensibility during the action of the devitalizer; others regarding it as subserving more the purpose of dilution of the arsenic, thus allowing more gradual action, and thereby insuring a more complete devitalization of the pulp. Rubbed into a paste with creasote, it forms a combination in general use for toothache, and for obtunding the sensibility of dentine. One-sixth of a grain of acetate of morphia is about equivalent in narcotic power to a grain of opium or 25 drops of laudanum. A preparation composed of 2 drachms each of sweet spirits of nitre and oil of cloves with 20 grains of acetate of morphia, is dispensed by some practitioners to their patients for use as toothache drops, if needed in their families, or when traveling.

The treatment directed to combat the effects of an overdose of morphia or opium is active emetics, strong coffee or tea, active stimulants, decoction of galls, flagellation, electro-magnetism, artificial respiration, and the free exhibition of belladonna, which has been considered a *physiological* antidote, though recent experiments tend to throw doubt upon this theory.

PHÉNOL SODIQUE.

(Phenate of Soda.)

This preparation is made by neutralizing phenic acid with soda, and is manufactured directly from wood, peat, or coal tars. Hæmostatic, antiseptic, and disinfectant, it is highly recommended as an astringent and styptic application to check excessive bleeding after extraction and prevent subsequent soreness of the gums. It causes the rapid absorption of the extravasated blood, thereby preventing fetor of the breath, and facilitates the speedy closing, healing, and hardening of the gums.

It is said to give almost magical relief to the "after-pains" of extraction, frequently less endurable than the pain on account of which the operation is submitted to. It may be applied, upon muslin or cotton, over and around the alveolus, but so placed as not to interfere with the closure of the cavity by a clot and the kind and prompt healing likely to result from its retention. For hemorrhage following extraction, it is preferred by many to the ferruginous preparations, as it appears to be entirely free from any escharotic or irritating qualities, and really sedative and antiphlogistic in its action.

As a wash for the mouth, it is highly recommended in that class of cases of soft, spongy, swollen gums, which bleed at the slightest touch, and for office use, to disinfect an unpleasant breath, caused by a diseased condition of the mouth or throat. It is also highly spoken of as a remedy in cases of diseased antrum. Used to meet varying indications, in its full strength, or diluted with from one to twelve times its bulk of water, or even more, say a teaspoonful to a tumblerful of water.

OIL OF CLOVES.

Oleum Caryophylli.

This oil is obtained by distilling cloves with water, to which common salt is added, in order to raise the temperature of ebullition. It is a stimulant aromatic and a powerful irritant, with a hot, acrid taste. It relieves toothache from irritated or exposed pulp, when introduced into the cavity of decay.

Where a patient's idiosyncrasy is such as to prohibit the use of creasote, the oil of cloves has been employed as a substitute, the beneficial results from its use being ascribed to its irritant properties; but it doubtless resembles creasote in possessing pain-obtunding, and probably antiseptic qualities.

For many purposes carbolic acid and creasote may be rendered quite pleasant, without detracting from their value, by equal admixture with oil of cloves.

A combination of oil of cloves, sweet spirits of nitre, and acetate of morphia is a favorite remedy with some for odontalgia. (See "Acetate of Morphia.")

CREASOTE.

Creasotum.

The therapeutic applications of creasote are given substantially under the head of carbolic acid.

The two articles bear so close a resemblance to each other that they have been considered by some identical; and though they have been proven to be distinct, yet they are often mixed, and nearly all the creasote of commerce for years past has been obtained from coal tar, and is carbolic acid.

CARBOLIC ACID.

This is a product of the distillation of coal tar, and differs from creasote obtained from wood tar chiefly by the absence of some eupione compounds which are associated with creasote. In antiseptic power as well as in physiological ef-

fects, it has a close analogy with creasote. When anhydrous, it is solid at ordinary temperatures, but may be readily melted by placing the bottle containing it in warm water.

As a therapeutic agent it is in very extensive use. It possesses stimulant, narcotic, irritant, styp-tic, antiseptic, caustic, and escharotic properties, uniting with albumen and gelatin, and forming with them insoluble compounds. It has remarkable powers as an antiseptic, and on this account is a valuable topical application in many cases attended with offensive purulent or other discharges. In its pure state it acts as a painful escharotic upon delicate surfaces, with a secondary grateful, soothing reaction.

It seems to have the effect of promoting the growth of healthy granulations and of hastening the healing process of wounds. It relieves pain without causing inflammation. When suppuration has set in, it arrests that process.

Its application should be repeated as long as pus is formed on the surface or prurient molecules spring up, but it should not be reapplied so long as the eschar of the former application remains attached.

It is considered very efficient in arresting temporarily the pain arising from an exposed pulp, and exceedingly useful in rendering the freshly

prepared cavity of a tooth less sensitive before filling. A small piece of cotton saturated with the acid, and allowed to remain in the cavity from five to fifteen minutes, will frequently obtund the sensibility, so that the filling can be inserted without pain. It is an invaluable remedy in the treatment of alveolar abscess; and in teeth whose pulps have been devitalized, the custom of many practitioners is to carry a pledget of cotton saturated with it to the end of the canal; and some operators are in the habit of touching the walls of all cavities with it before filling. Diluted with 40 volumes of hot water to 1 of carbolic acid, well shaken, and then filtered, it is valuable as an injection for sluggish abscesses, fetid ulcers, gangrenous wounds, and cases of caries or necrosis, in which it may be injected through the fistulous openings. For dilution, to use as injections, gargles, etc., it may be mixed with alcohol, and afterward any desired quantity of water can be added. A few drops of this mixture in a tumblerful of water is resorted to by some practitioners as a disinfectant mouth-wash for office use in special cases. For local application, five drops or more of the fluid may be added to an ounce of glycerin or simple cerate. If the acid should come in contact with the skin, its caustic action can be prevented by removing it with a little oil.



Carbolic acid may be rendered quite pleasant, without detracting from its value for many uses, by mixing with it an equal part of oil of cloves.

CARBOLIC ACID AND GLYCERIN.

Acid carbolic, ℥ss;
Glycerina, ℥xv.

Recommended as an excellent application in ulceration of the nose and throat, and in fetid or ichorous discharges.

A writer in the *Medical and Surgical Reporter* says: "With this preparation, and its dilutions with glycerin or water, I claim an agent that will relieve and control with more certainty and celerity, phagedæna, sloughing ulcers, bed-sores, chronic, syphilitic, mercurial and strumous ulcerations, sloughing gummatis, phagedenic chaneres, and all that class of obdurate ills, more satisfactorily than any agent that has come within the range of my experience. . . . It is invaluable for nasal, facial, tonsilar, pharyngeal, laryngeal, tracheal, and bronchial ulcerations."

IODINE.

Iodinium.

Iodine operates as a general excitant of the vital actions, especially of the absorbent and glandular systems. Its effects are varied by its degree of concentration and the quantity used, and hence it may prove corrosive, irritant, desiccant, or tonic.

In glandular enlargements and morbid growths it is without a rival as a remedy.

In mercurial salivation, a gargle is recommended of 3 to 6 drachms of the officinal *tincture of iodine* with from 15 to 30 grains of *iodide of potassium* dissolved in a half pint of water.

Tincture of iodine may be made to cause slough, if used in sufficient quantity and kept pressed upon the part; but its principal use is as a stimulant to granulation and to harden the molecules to the standard of health normal to the part. Diluted to meet the various indications, it is used as an injection in abscesses.

A stronger tincture may be made by adding 2 drachms of iodine to a fluidounce of *absolute alcohol*, shaking the mixture frequently, until it is dissolved, which will require a number of days.

This is one of the best of the "dental poly-

chrests," and in careful hands is capable of meeting a great variety of indications. It is especially useful in fungoid growths of the gums or exposed pulps, and suppurating margins of the gums and follicles of the mucous membrane.

The manner of applying it will vary according to the desired depth of its action. For a fungoid growth the membrane surrounding it should be carefully dried, to prevent the remedy from spreading over the healthy structure, and then applied carefully upon the morbid growth, keeping the mouth open and the part exposed to the air until a metallic pellicle is formed. The mucous membrane of the lip should then be protected by a pack of cotton, either dry or saturated with tannin and glycerin.

For diseased mucous membrane, the solution should be applied with a tuft of cotton wound on the end of an instrument or held in a pair of tweezers, without drying the membrane, so that the affinity between the water in the mucus and the alcohol in the remedy may cause it to spread rapidly over the surface. To prevent it extending further than desired, a wad or pack of bibulous paper or a napkin may be applied so as to dry the surface and thus limit the action. Keep the mouth open as before, until the metallic pellicle

is formed and perfectly dry. No further dressing will be necessary in this case.

Tincture of iodine may be decolorized by slowly adding to it a saturated solution of hyposulphite of soda, but it requires so much that it materially dilutes the tincture. The following formula has been recommended for this purpose: Tincture of iodine, 6 fluidrachms; distilled water, 2 fluidrachms; hyposulphite of soda, 108 grains. Triturate the soda with the water, and add the tincture of iodine gradually, with constant stirring. When the process is completed, filter. That which is sold in the shops as colorless tinct. of iodine is probably a solution of iodide of ammonium.

Iodine, glycerin, and tannin, in varying proportions, meets most happily a great variety of sub-acute and chronic conditions, as abscess, ulcer, passive congestion, etc.

There are two officinal ointments of iodine, *Unguentum Iodinii* and *Unguentum Iodinii Comp.* The compound ointment is somewhat stronger with iodine than the other. There is also an officinal ointment of *iodide of potassium*. They are used for similar purposes—the discussion of scrofulous swelling of the glands and other chronic tumefactions.

Iodide of ammonium possesses properties analogous to those of iodide of potassium. As a stim-

ulant alterative it is applied to enlarged tonsils, etc., dissolved in glycerin, 30 grains to the ounce.

Iodide of cadmium has been used in similar conditions, dissolved in glycerin, or made into an ointment, 1 drachm to the ounce of lard. This is an excellent remedy where the discoloration of the skin by iodine would be objectionable.

The stains of iodine may be removed from the skin by spts. of ammonia, or by a strong solution of hyposulphite of soda.

IODINE AND CARBOLIC ACID.

This solution is prepared as follows :

R. Tinct. iodinii comp.,	℥xlvi;
Acid carbolic cryst.,	℥vj;
Glycerina,	℥j;
Aq. destillat.,	℥v.

The iodine color gradually disappears, and the solution becomes colorless in from eight to ten hours, or as many days, depending upon the temperature.

(A solution may be made containing double the quantity of iodine, but a longer time is required to decolorize it.)

This compound possesses antiseptic and stimulant properties in a marked degree, and has

met with favor as an application in the form of injections, gargles, and lotions, in that class of cases in which iodine is prescribed—in sore throat, ozæna, abscess in the ear, etc.

Dr. Percy Boulton, to whom the profession is indebted for this compound, claims that it possesses therapeutic virtues of superior efficiency and is intrinsically a more efficacious agent than either iodine or carbolic acid, separately, in its power to modify the mucous membranes and diminish sensibility.

It may be used in its full strength, or diluted to meet various indications.

IODINE IN GLYCERIN—Saturated Solution.

In patients very susceptible to the action of iodine, this form is preferable to the alcoholic solution or that in creasote. For strumous patients it should be applied around the margins of the gums and over the inflamed surfaces of the mucous membrane on cotton, or painted on with a camel's-hair pencil, repeated once or twice daily. It is well adapted to the more benign forms of aphthæ and gum-boil, when very circumscribed and mild.

IODINE IN CREASOTE—Saturated Solution.

Where there is much suppuration from necrosed roots or processes, this is a powerful agent in changing the pus-producing to a plasm-producing surface. It stimulates debilitated parts capable of restoration to health, but destroys such as are too weak to respond to its action. No fungous growth can long resist its continued application.

It should be neatly applied, avoiding contact with the healthy parts, and not repeated oftener than once in twenty-four hours, nor too freely used.

It is hardly necessary to say that the necrosed roots and bones must be removed to enable it to effect its curative agency.

PRICKLY ASH.

Xanthoxylum.

The bark is a stimulant, and acts as a sialagogue.

A decoction of the bark is used as a wash for foul ulcers.

The tincture of xanthoxylum has proved serviceable for removing the soreness which remains after the pulp of a tooth has been extirpated.

A strand of floss silk, saturated with this tincture, is introduced into the pulp cavity, and the application renewed frequently.

PELLITORY.

Pyrethrum.

The root is officinal. A powerful local irritant; producing a tingling, burning sensation in the mouth and throat, and exciting a copious flow of saliva. A strong alcoholic extract has been employed for obtunding sensitive dentine, and as a remedy in periodontitis; but it has fallen into disuse as more potent and reliable remedies have been introduced.

In the form of decoction or tincture, diluted, it is recommended as a sialagogue and local stimulant to the gums and mucous membranes.

The ethereal oil of pyrethrum is a pleasant application for the relief of odontalgia.

COBALT.

A reddish-gray metal, generally combined in its ores with arsenic. Some prefer cobalt to arsenious acid for destroying the nerves of teeth, being of the opinion that less irritation follows its action. It has also been used as an application

to sensitive dentine, on the supposition that it is not absorbed so readily as arsenious acid when employed for the same purpose; but there is no proof of this.

SULPHATE OF ZINC.

Zinci Sulphas.

Tonic, astringent, and alterative. Its solution constitutes a good styptic to bleeding surfaces, and in some conditions of ulcerated sore throat forms a useful gargle, in the strength of from 1 to 5 grains to the fluidounce of water; but its unpleasant taste renders it objectionable for this purpose.

Dried and finely powdered, mixed in the strength of an ounce of the powder to a drachm of glycerin, it is a powerful and painful escharotic, but has the advantage of not causing constitutional disorder from absorption, such as is sometimes produced by the arsenical preparations. It is highly recommended as an injection in the treatment of some forms of diseased antrum, in the strength of from one-half to 3 grains to the ounce of water.

In doses of from 10 to 30 grains in solution, it is an almost instantaneous emetic. It is regarded as the safest of the powerful quick emetics, and

is generally relied upon for the prompt dislodging of poisons.

Sulphate of zinc in an overdose acts as an irritant poison, and from its close resemblance to Epsom salts serious mistakes have occurred from its use.

CHLORIDE OF ZINC.

Zinci Chloridum.

This is a powerful escharotic and disinfectant. As an application to freshly cut surfaces, its action is to arrest bleeding and secure union by the first intention by inducing exudation of glutinous matter from the severed tissues. A solution of 20 grains to the ounce of distilled water may be used for such purposes.

As an injection into sinuses and sluggish abscesses, it is considered very efficient. For such cases a solution double this strength, or even stronger, has been recommended, but caution would be required in its use.

Where foreign deposits have caused the gums to recede, teeth to become loose, and pus and broken-down tissue to exude from the alveoli, an application of this remedy has been used, and is highly recommended.

The treatment consists in a complete removal of all foreign matter, and the injection of the solu-

tion by a hypodermic syringe, which should be carried to the depth of the loosened tissue, or, in other words, as far as possible without invading healthy structure, discharging a few drops of the solution, and shifting the syringe so as to make sure of bringing the application in contact with all the unhealthy surfaces. In the majority of cases it is said only one such application is needed. In the strength of 1 grain or more to the ounce of water, chloride of zinc is used as an injection in diseases of the antrum.

This salt is eminently deliquescent, and is most powerfully escharotic in its deliquesced state.

It is used for obtunding sensitive dentine, and by those who extol it most it is employed in this escharotic form, the cavity of decay *being carefully dried* and the entrance of the fluids of the mouth precluded. A small drop of the deliquesced chloride of zinc is placed upon the sensitive portion of the dentine; a steady but bearable pain is produced, which is generally of from one to three or four minutes' duration. Proximity to pulp should be noticed, and irritation of that organ prevented by capping with gutta-percha. *Throbbing* instead of steady pain is the diagnostic symptom of pulp irritation, which complication during the application of chloride of zinc is the only dan-

ger to be apprehended from the use of this escharotic.

The pain peculiar to the application should be allowed to pass away before excavating, and it is probably due to the fact that many who have tried this article have commenced operating too soon, or have proceeded too rapidly, and thus have been indisposed to regard it favorably as an obtunder.

Being decomposed in exerting its power as an escharotic, it necessarily acts but superficially if a small quantity only is applied, and thus care is requisite to remove only that portion of sensitive dentine which has become obtunded, after which the application may be repeated as desired.

Dissolved in ether or chloroform, it is regarded by some as less painful during its application; others recommend putting a little creasote or carbolic acid into the cavity before applying the chloride of zinc.

Diluted, this salt becomes in turn irritant, astringent, detergent, and stimulant.

Chloride of zinc—except in medicinal doses, which are very small—acts as a corrosive poison, the effects of which are combated by the carbonated alkalies, which act by converting the poison into carbonate of zinc.

OXYCHLORIDE OF ZINC.

The medico-mechanical application of this agent is comparatively recent in dentistry, and has been brought to the notice of the profession under various names—Os Artificiel, Osteoplastic, Bone filling, etc. That in most general use for ordinary plugging is composed of oxide of zinc, borax, and silex, moistened with a solution of chloride of zinc of the strength of 1 ounce of the salt to 6 drachms of water. This preparation has been extensively tested as a capping or temporary filling over freshly-exposed pulps, and with results which are represented as very gratifying. For this purpose, however, the fluid should be chloride of zinc 1 ounce, water 1 to 2 ounces, making a solution of only sufficient strength to cause the mixture to set. On its removal, months after, the subjacent pulp has been found healthy, and even protected by a deposit of secondary dentine. The success which has attended its use gives hope of relief from the necessity of extirpating exposed pulps, when they have not taken on a highly inflamed condition. The cavity having been cleaned, creasote should be applied to the exposed pulp, and the oxychloride introduced in a semifluid state. The pain experienced varies in intensity.

It is generally of short duration, but may in exceptional cases continue for an hour or even longer. The permanence of this material greatly depends upon its being perfectly protected from the fluids of the mouth until it becomes quite hard (requiring about half an hour), which may be assured by any of the methods deemed most advantageous for preventing the ingress of saliva, the rubber-dam, in this connection, as in the insertion of gold, proving a most valuable appliance. It is best to introduce a surplus of material, to admit of trimming into proper shape, which *may* be done at once, although it is advisable to cover it with a protective layer of gutta-percha in chloroform, and allow several days to intervene, for the more thorough solidification of the cap prior to the removal of the excess of material and final insertion of the metal stopping.

There is another direction in which oxychloride of zinc proves a most valuable adjunct in efforts for the preservation of teeth, viz., in filling the bulk of cavities in treated teeth. By this method many advantages accrue, among which may be mentioned the saving of time and expense, with an equally durable result; the diminution of the risk of periodontitis, so liable to supervene upon prolonged violence; the avoidance of risk of fracture in frail teeth, and the equal support insured;

the obviation of the yellow color when the enamel is thin; and, in the event of subsequent trouble, the comparative ease with which its removal may be effected. The gold must of course leave no portion of the oxychloride exposed.

This material is likewise employed for securing the effects of chloride of zinc in the hypersensitiveness of dentine,—used as a temporary filling, and allowed to remain until, in the judgment of the operator, its effects are induced. Should tenderness recur in excavating, a second and even a third application may be found advantageous.

NITRATE OF SILVER.

Argenti Nitras Fusa; Lunar Caustic.

The pure salt in crystals (*Argenti Nitras*) is the form in which this remedy is used for internal exhibition, and sometimes, in cases requiring nicety, it is employed in solution externally; but generally that which comes in the form of sticks of the size of a goose-quill, and known as lunar caustic, is the form prescribed for external use.

In vitiated conditions of the mucous membranes and gum tissue, this salt may be used in the solid form or in aqueous or ethereal solution. In varying strength, from 1 to 60 grains to the ounce, it

is stimulant, alterative, detergent, deobstruent, styptic, discutient, vesicant or escharotic.

A solution, made in the proportion of half a grain of the crystals to a fluidounce of distilled water, forms a good mouth-wash for healing ulcers produced by mercury; and in inflammation of the mouth from mercurial salivation, or in cases of inordinate secretion from the edges of the gums, for stubborn ulcers and aphthous sores of the mouth, a concentrated solution, 1 drachm to an ounce of distilled water, applied by means of a camel's-hair brush, has been found very useful.

It has also been used with advantage in some abnormal conditions of the maxillary sinus as an injection, in the strength of from 1 to 5 grains of the salt to a fluidounce of distilled water, and as an injection into fistulæ.

Should the pain produced by its external use be excessive, it can be immediately allayed by washing the parts with a solution of common salt, which acts by decomposing the caustic.

As a styptic it is not so reliable as the styptic preparations of iron, or even as tannin. Like sulphate of copper, sulphate of zinc, acetate of lead, etc., it forms a coagulum with albumen, but the clot is soluble in an excess of albumen, while that formed by tannic acid and perchloride and persulphate of iron is not soluble in albumen or any

other constituent of the blood. It is a powerful caustic, whether applied to the soft parts or to the bony tissues. It has been recommended as an application in the solid form or very strong solution to sensitive dentine; it acts on the gelatinous portion of the tooth, destroying its vitality to the extent of the combination which takes place.

It is with some practitioners a favorite application, in the solid form, to obtund sensitiveness where abrasion of the teeth has exposed the dentine.

Though capable of meeting a great variety of morbid conditions, this salt is less frequently used in the mouth than formerly, on account of its persistent bitter, metallic taste, and because other remedies not open to this objection have been found to meet the indications as well.

To obviate the effects of poisoning by nitrate of silver, a strong solution of common salt is directed (which converts it into chloride of silver), followed by emetics and antiphlogistic treatment.

TERCHLORIDE OF GOLD.

Gold dissolved in *aqua regia* and the solution evaporated to dryness.

It is an escharotic and disinfectant. In its physiological effects it is similar to corrosive sublimate.

It is used as a local application to sensitive dentine. For this purpose the ethereal solution is preferable to the aqueous. It is applied, like chloride of zinc, on a pellet of cotton, and acts more promptly and with less pain.

It is not absorbed by the dentine, but forms an insoluble compound with the gelatinous elements.

It is very liable to decomposition. By exposure to air or light the gold is precipitated in the metallic form.

OXALIC ACID.

Acidum Oxalicum.

This acid has recently been recommended for bleaching discolored teeth, and it will no doubt act efficiently where color depends on the presence of the salts of iron; but it has a powerful affinity for lime salts, and should therefore be allowed to remain but a very short time in contact with tooth substance. An injudicious use of it would result in the destruction of the tooth.

Oxalic acid is a virulent poison, and fatal mistakes have occurred on account of its having some resemblance to Epsom salts. A saturated solution of it is very useful in removing iron and ink stains from the fingers.

In poisonous doses it destroys life with great certainty and rapidity. The treatment of poison-

ing by oxalic acid consists in the free administration of chalk or carbonate of magnesia.

CHROMIC ACID.

Acidum Chromicum.

This acid is in the form of brilliant crimson-red crystals. It is deliquescent and very soluble in water. It is one of the most powerful escharotics known, and acts as a rapid destroyer of organic matter.

It has been recommended for bleaching discolored teeth, and to obtund sensitive dentine; but its application produces so much pain and is so destructive to the tissues, that it would require great skill and judgment not to do more mischief than good by its use.

For morbid growths upon the gums, chromic acid is a valuable remedy, if intelligently used. It may be applied deliquesced or diluted, to graduate the action according to the effect desired. It is most conveniently applied by means of a gold or platinum wire. *Great care should be exercised to protect the healthy parts.*

ARSENIC.

Arsenicum.

Arsenic is a brittle, crystalline metal, of a steel-gray color, presenting a brilliant surface when recently broken or sublimated. It is almost invariably present in cobalt ores, and it is from these that the arsenious acid or white oxide of arsenic is obtained. By roasting the ore in furnaces the arsenic is converted into arsenious acid; sublimation of this product ensues, and it is condensed upon the sides of flues arranged for the purpose.

Arsenious acid (*Acidum Arseniosum*), in medicinal doses, is alterative and antiperiodic; applied externally, it is violently irritant. It was from this fact that Dr. John R. Spooner, of Montreal, suggested its use, as early as 1836, for the purpose of devitalizing the dental pulp.

It has been employed in different combinations and according to various directions ever since that time. The prevailing method at the present day is in combination with a salt of morphia and creasote (carbolic acid). The acetate of morphia, as suggested by Dr. Spooner, possesses advantages over the sulphate. (See "Acetate of Morphia.") The creasote or carbolic acid is employed for the double purpose of obtunding pain during the opera-

tion of the arsenious acid, and of giving a convenient form (paste) for making the application. It holds the arsenic and the morphia together mechanically, not dissolving them, as has been asserted. The use of this paste is now principally confined to the devitalization of the dental pulp when exposed. It has been largely employed for obtunding sensitive dentine, but its effects have proved so disastrous in the opinion of a large number of operators, that they have entirely abandoned it. Those who still contend for its value, concede that its employment for this purpose should be *exceedingly* limited, and the duration of its application not more than from one to two or three hours, unless found absolutely necessary upon examination.

It is proper to add that the use of arsenic in dental practice, for any purpose whatever, has been denounced, on the ground that, as an application to sensitive dentine, it is liable to cause the death of the pulp, and that there is no possible case in which its destruction should be purposely attempted.

Arsenious acid, administered internally or applied externally in an overdose, is a violent irritant poison. The treatment recommended in such cases is prompt emesis, provoked by the finger or the feather part of a quill, and the administration

of an emetic, such as sulphate of zinc, followed by demulcent drinks—either milk, white of eggs, or flour and water.

The antidote is the hydrated sesquioxide (peroxide) of iron, procured by the addition of an excess of liquor ammoniæ to muriated tincture of iron, or better, to liquor ferri tersulphatis, which yields the peroxide as a dense precipitate. It should be given in tablespoonful doses every five minutes until the symptoms are relieved.

LITMUS.

Lacmus.

A peculiar blue coloring matter, derived from certain lichens. Used as a test of acids and alkalis. Employed either in infusion or in the form of litmus paper.

Litmus paper is prepared by forming a strong, clear infusion with 1 part of litmus to 4 of water, and dipping slips of white unsized paper into it. The paper should then be carefully dried, and kept in well-stopped bottles, from which the light is excluded. It is a very delicate test for acids, the paper turning red immediately upon being touched with any acid solution. As a test for alkalis, redden the solution by the addition of an acid, and prepare paper slips as before directed,

which will turn blue if touched with any alkaline solution.

STRONGER ETHER—*Æther Fortior.*

PURIFIED CHLOROFORM—*Chloroformum Purificatum.*

Ether was formerly called sulphuric ether, on account of the sulphuric acid employed in its preparation; it contains no sulphuric acid, and accordingly its name has been changed to *Æther* in the U. S. and British Pharmacopœias,—the term *Æther Fortior*, or stronger ether, expressing that which has been redistilled with lime and chloride of calcium, to render it suitable for medicinal use.

When pure, it will not redden litmus paper, and will boil actively when a test-tube half filled with it is held in the hand and a small fragment of glass is dropped into it. When too long kept it undergoes decomposition, and is converted in part into acetic acid.

It is very inflammable, and the greatest care should be used not to bring it in the vicinity of flame, as for example a lighted candle. When its use by artificial light is unavoidable, the utmost caution must be exercised in keeping the ether *below* the level of the light, as, the great specific

gravity of the vapor causing it to fall, the liability of ignition is thus very much lessened.

Purified chloroform is a neutral liquid, and neither reddens nor bleaches litmus paper; when pure, if poured upon the hand, it quickly evaporates, leaving scarcely a perceptible smell. It is liable to decomposition by sunlight or even diffused daylight, and hence should be kept in bottles, covered with dark paper, and in a dark place. It is not inflammable.

These, in addition to nitrous oxide, are the only agents in common use for producing general anæsthesia for surgical purposes. They both possess the property of producing, when inhaled, partial or entire insensibility to pain, with or without total loss of consciousness. The usual apparent effects produced by either are not very dissimilar; relaxation and loss of power over the voluntary muscles, insensibility to pain, and profound coma, are the common results.

The rationale of their action upon the economy is still in dispute; but that they produce their effects by entirely different methods does not seem to be doubted; and so thoroughly is this believed by some, that they use one as an antidote to an overdose of the other, although others give the two variously combined—for what reason does not clearly appear.

The advantages urged in behalf of chloroform are the smallness of the dose, promptness of action, more agreeable effects, less tenacious odor, and greater facility of exhibition, while its narcotic influence is markedly more persistent than that of ether. On the other hand, it is generally admitted that chloroform is more dangerous to life than ether. Notwithstanding many assurances to the contrary, it must be apparent that a condition so closely resembling death cannot be produced by any agent whatever without great risk of life, where morbid conditions of the heart, lungs, or brain exist, or when the administration is carelessly performed or the administrator is ignorant of physiology, unable to estimate the life-power of his patient, and to read intelligently the successive steps of the unnatural condition which he is producing; and unless he can read these manifestations as he would an open book, he should not venture upon the experiment. A knowledge, too, of the most appropriate remedies and treatment, when signs of danger appear, and having those remedies within instant reach, are absolutely essential; nor can the great importance of employing a perfectly pure article be overrated.

A striking fact, to which attention has been repeatedly called, is that the fatal cases have been

in inverse proportion to the severity of the operation. This is in part accounted for by the tolerance of proportionately heroic measures where excessive demands are made upon the nerve centres, as in capital operations; but the most probable solution is that of position—the recumbent being the rule in surgical and the sitting posture in dental operations.

Taking into account the comparatively slight pain caused by the extraction of a tooth, the almost instant manner in which it is performed, and the conceded fact that anæsthesia is not free from risk to life, it would seem that, unless in exceptional cases of morbid sensitiveness, or unusual difficulty and severity in the operation, so great an interference with life-actions as is included in the condition termed anæsthesia should not be undertaken. Those who desire to administer anæsthetics should make themselves familiar with the literature of the subject, and from the conflicting opinions as to relative advantages and dangers, modes of administration, methods of action, means of averting threatened danger, etc., form definite and well-settled conclusions. To attempt the task of giving, even from any single standpoint, directions which would qualify a novice to administer these agents, would extend this volume far beyond its design.

It is the rule in general surgical operations for one person to devote his attention exclusively to the administration of the anæsthetic; but in dental operations the dentist has the advantage of having his attention directed just where the most valuable indications of the anæsthetic condition are presented, viz., to the respiration, the eye, the countenance, etc.; but an assistant should always be at hand in case of trouble.

When asphyxia results from the administration of anæsthetic agents, such efforts should be made for resuscitation as the following: The napkin or inhaler being removed, the patient's tongue should be drawn forward with forceps or a tenaculum, fresh air admitted from the door or windows, or induced by a fan, and artificial respiration instituted, using stimulating applications to the surface, and cold water to the face and head. The main reliance, however, is on artificial respiration, and this is best kept up by Marshall Hall's "ready method," as follows: "Turn the body gently, and completely, *on the side and a little beyond*, and then *on the face*, alternately; repeating these measures deliberately, efficiently, and perseveringly, fifteen times in a minute." When the patient reposes on the thorax, this cavity is compressed by the weight of the body, and expiration takes place; when he is turned on the side, this pressure is

removed and inspiration occurs. When the prone position is resumed, make equable but efficient pressure along the spine; removing it immediately before rotation on the side (the first measure augments the expiration, the second commences inspiration). As soon as the patient can swallow, give brandy and ammonia. Efforts at resuscitation should not cease until death is evident beyond all question.

Another method of producing artificial respiration is known as Sylvester's. It consists in laying the patient on his back, drawing the tongue forward, then carrying the arms slowly upward over the head, thus elevating the ribs by means of the pectoral muscles, and inducing inspiration; the arms are then brought down to the side of the chest and slightly compressed against it; these movements are to be repeated slowly, as in the other method. If a galvanic battery is at hand, it should be resorted to among other possible means of restoring animation. It is recommended to apply the positive pole of the battery to the back of the neck, and the negative pole to the end of the breast-bone: breaking and renewing the current about fifteen times per minute.

Nitrous oxide has been suggested as a *physiological* antidote to all such poisonous agents, but

its efficiency in these relations is still an open question.

Chloroform is used, either alone or in combination with creasote, as an application to aching teeth, and in some instances gives instant relief. Locally it is a powerful stimulant, and, if confined closely upon the part, is escharotic to weak tissues. It is an efficient antiseptic, and is recommended as a gargle, in the strength of 1 or 2 drachms to the pint of water, in foul ulcers of the throat, for the purpose of relieving pain, destroying fetor, and promoting the separation of diseased parts.

NITRATE OF AMMONIA AND NITROUS OXIDE.

Nitrous oxide for anæsthetic purposes has come into such general use, that information is constantly asked in reference to its properties; the materials used in its manufacture; the process of generating it; how to determine the purity of the nitrate, and of the gas when made, etc.

As found in commerce, nitrate of ammonia is crystallized, granulated, and fused. The fused salt is made^e by melting down the crystals, and allowing them to solidify into a compact mass on cooling. The granulated is made by evaporating the solution to such a density that it would solidify

on cooling, then reducing the heat and stirring the mass until it cools.

The three varieties are all more or less deliquescent, and should be kept in a dry place, excluded from the air.

The fused is generally preferred, because the amount of gas given off by equal weight of the three varieties is somewhat in favor of the fused and granulated, and the latter is objected to by some on account of its greater liability to absorb moisture and gain weight by exposure to the air. If pure, when heated on platinum foil the nitrate should volatilize completely. A residue of any considerable amount would indicate the presence of some non-volatile salt—probably nitrate of potash or soda. A solution of nitrate of ammonia should not afford a precipitate on addition of a few drops of chloride of barium, which would indicate sulphuric acid; nor on the addition of a few drops of a solution of nitrate of silver, which would indicate the presence of chlorine.

Sulphates and chlorides are almost always present in commercial nitrate of ammonia; but if the solution is rendered only turbid, without affording an immediate precipitate with the above reagents, it is sufficiently pure.

The various effects of increasing heat upon nitrate of ammonia are shown by the following table:

At 226° F. fuses perfectly.

At 302° F. emits white fumes, condensing in drops.

At 347° F. effervesces slightly.

At 356° F. boils without decomposition.

At 437° F. effervesces rapidly.

At 460° F. begins to evolve gas.

At 482° F. evolves gas in abundance.

Above 500° F. *nitric oxide* is given off.

To determine the temperature, thermometers have been prepared which may be passed through the cork and into the retort, marking the following degrees: 226°, 356°, 460°, 482°, 500° F.

To obtain the largest amount of gas, the nitrate should first be melted in the retort at a temperature just sufficient (226° to 250° F.). When melted, the heat may be at once carried up to the point of decomposition, 460° F. If a gradually increasing heat is used after the salt is melted, a portion of it will sublime unchanged until the temperature reaches 460° F. The heat should never be allowed to rise above 482° F., for beyond that noxious products are generated. After the gas has begun to come over briskly, the appearance of copious white fumes in the retort is an indication that the heat is too great. The nearer the heat can be kept at the point necessary to generate nitrous oxide, the purer will be the gas.

After the decomposition has fairly commenced, the heat must be lowered rather than increased, as by that time the sand, retort, and the salt itself have accumulated enough heat to carry on the generation of gas for some time, even if the flame were entirely withdrawn.

A sand-bath should always be used to protect the retort from the direct heat, which may be supplied by means of a suitable gas-burner, or by an alcohol or kerosene lamp.

The retort must be of glass; no other practical material has yet been found to answer the purpose. The retort is usually sold with a ground-glass stopper; but owing to the variations of temperature to which the retort is subjected, it causes trouble by being too loose at times, and difficult of removal at others. A good cork is to be preferred. These retorts are made of various shapes; that which seems to have given entire satisfaction is illustrated in the cut accompanying this article.

The solutions recommended for washing the gas—caustic potash and copperas—are intended to neutralize any noxious products caused by the use of impure nitrate of ammonia, or by an excess of heat in the process. The caustic potash solution neutralizes any free nitric acid which may distill over. The copperas solution destroys

either chlorine or nitric oxide—binoxide of nitrogen. The sulphuric acid is added to the copperas solution to prevent precipitation and insure a clear solution. After having passed through these solutions, it should not be inhaled immediately, but allowed to remain for two or three hours in the receiver over the water. It can then be tested by breathing it, and if it has not a coppery taste, and does not produce a hot sensation in the lungs, it may be relied upon as pure; but if it cannot be breathed pleasantly, it should be allowed to remain in the gasometer until it can. When pure it possesses a very slight odor and a sweetish taste. It improves by age, and in a gasometer, such as is illustrated on a subsequent page, may be kept for many weeks; for although water takes up from 5- to 8-10ths of its own bulk of the gas, after it is once saturated it will not take up any more, except as the water will gradually give out the gas and take up air through the surface exposed between the holder and receiver. It has been suggested that, if this surface were covered with a thin film of oil, this process would be entirely prevented, and gas thus protected has been said to have been retained in the gasometer for a month.

The mouth-piece or inhaler should be constructed with a double valve, preventing the exhalations

from the lungs from being thrown back into the gasometer or bag from which the gas is administered.

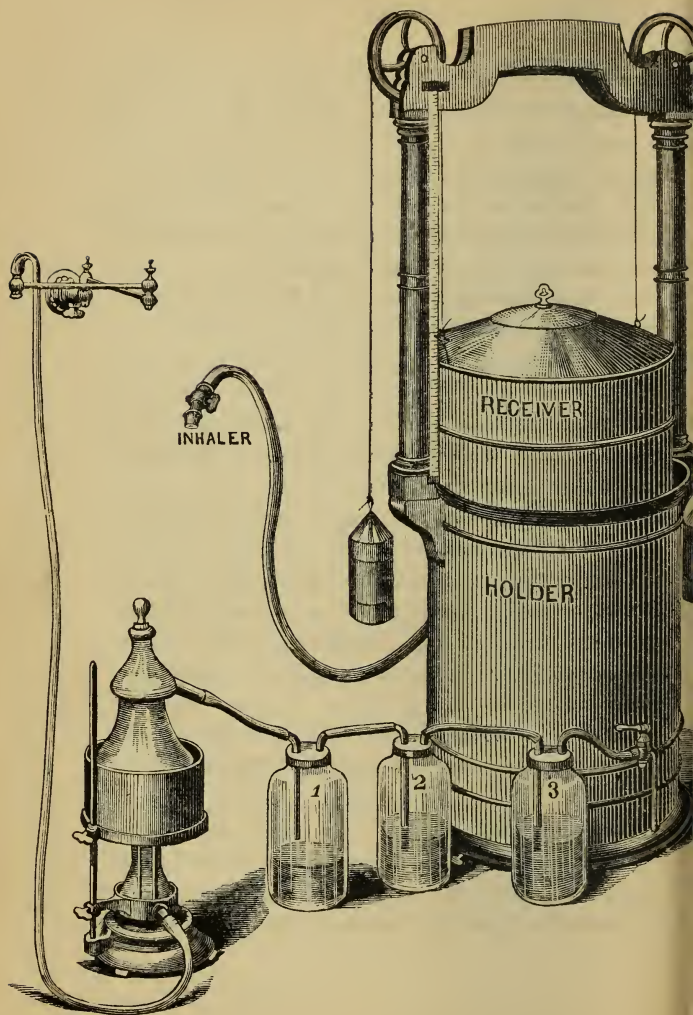
Some operators have the gasometer placed in the cellar or in a room adjoining the office, and connect with it by a rubber tubing passing through the floor or partition, thus allowing the patient to inhale directly from the gasometer. Others prefer taking the gas from the gasometer as it is wanted, in an India-rubber bag, from which it is administered. It is only necessary, when the bag is to be filled, to connect it by tubing with the supply-cock of the gasometer, and by a little downward pressure on the receiver the gas will be forced into the bag. The capacity of the bag should not be less than 8 gallons, although when breathed in and out, as some operators administer it, 6 gallons or less will generally produce anæsthesia. This effect usually occurs in from thirty seconds to a minute and a half; insensibility to pain is oftentimes reached before the patient is entirely unconscious. Anæsthesia is generally, although not invariably, manifested by snoring, but it is not always necessary to carry the effect to this point; and, notwithstanding the assurances to the contrary, there are many who do not believe that profound anæsthesia, produced by any agent, is entirely free from danger. At all events, it is

the dictate of prudence to proceed no further than is absolutely indispensable. It is customary to hold the nose of the patient so that no atmospheric air is mixed with the gas inhaled; but this practice is energetically opposed by some, who assert that an admixture of air is positively necessary to the safety of the patient.

It is administered by some practitioners to every patient who presents, without regard to the state of the health; but there is reason to believe that caution should be observed in this direction, and that it should not be given to those having heart disease, who are predisposed to apoplexy, or whose lungs are seriously affected, nor, as a rule, in any case where there is serious disturbance of vital functions. The unconscious state usually continues from a half to one minute, and in two to three minutes almost all return to a perfectly normal condition. If the operation is protracted, more gas can be given when sensibility to pain returns.

Dr. Geo. J. Ziegler, who has carefully investigated the properties of this agent, claims that, "nitrous oxide is very efficient, as a restorative. It may be administered either in its gaseous state by the lungs or in conjunction with liquids by the alimentary canal. It should be given gradually in moderate quantities, so as not to generate too

NITROUS OXIDE GAS APPARATUS.



much carbonic acid. Both it and oxygen are of primary importance in asphyxia. In chemical character and physiological influence they are the direct opposites and natural antidotes to narcotizing agents and asphyxiated conditions. They should always be employed whenever practicable, as either alone or in combination with heat, they will often save life even in apparently hopeless cases."

DIRECTIONS FOR SETTING UP.

Place the holder in a level position, and fill it with water to within an inch or two of the lower edge of the taper rim.

A piece of lime the size of an egg will help to keep the water pure.

Now open all the spigots, especially the one in the top of the receiver, and gently sink it into the water; then close the spigot in the top of the receiver and that on the upper edge of the holder, and arrange the weights that are attached to the receiver.

Put into the first jar (No. 1) about a pint of water. Into the second jar (No. 2) such an amount of water that the long pipe attached to the lid shall dip about one inch below its level; then add a half teaspoonful of sulphuric acid (oil of vitriol) and about a quarter pound sulphate of

iron (copperas). Into the third jar (No. 3) put a like quantity of water and add a couple of sticks of caustic potash.

Arrange the jars in line and connect them by tubing, as shown in the cut. The tube from the retort must connect with the LONG pipe of jar No. 1, and so on. When properly arranged, a current of air blown into the tube intended to connect with the retort will cause the water to bubble in jars Nos. 2 and 3, and if the spigot to which No. 3 is attached be open, the receiver will begin to rise.

Put into the retort the quantity of ammonia intended to be used (1 lb. will make about 30 gallons of gas).

Place the sand-dish upon the stove, with sand sufficient to protect the retort. Connect the long pipe of the first jar to the retort by rubber tubing, so that the condensed steam may run into it.

Now apply the heat gradually, and watch the process, being careful not to overheat the ammonia.

The heat should be shut off before the ammonia is quite all decomposed, in order to avoid breaking the retort; and before the gas has quite ceased to come over, *the retort should be disconnected from the first jar*, and the receiving spigot closed. This is an essential point, for if not attended to promptly, and the atmospheric pressure thus equal-

ized, the solutions will be forced from one jar to another and into the retort, in consequence of the partial vacuum created by the withdrawal of the heat.

It will be understood that the first jar is merely to receive the drip; the use of the water is simply to keep the jar cool, and the tendency to become overheated may be obviated by setting it in a vessel of cold water. Fresh water may be substituted at each operation.

The solution of copperas should be renewed when it loses its green color, and the potash solution when it loses its alkalinity, as shown by its not turning red test-paper blue.

The inhaling tube is attached to the top spigot of the holder.

The register indicates the number of gallons of gas in the holder, as well as the quantity inhaled.

If by accident water should get into the pipe by which the gas enters the receiver, it can be drawn off by the little screw-plug at the bottom of the holder.

BICHLORIDE OF METHYLENE.

This new anæsthetic agent has recently been introduced by Dr. Benjamin W. Richardson, of London.

It is prepared by the action of sulphuric acid on zinc in chloroform, and is a colorless liquid, with an odor like that of chloroform. This agent is considered more manageable than chloroform, the subject yielding gradually to its influence, without passing through the stage of excitement common to all other general anæsthetics. It is administered upon a sponge, in a Clover's bag, or from a funnel.

One drachm of bichloride of methylene corresponds to forty grains of chloroform. Several cases have been reported in which this new anæsthetic has been employed in severe surgical operations on the human subject. In all the most satisfactory anæsthesia has been obtained, and in none have any untoward symptoms been noticed; but a much more extended series of observations will be necessary to determine its rank among anæsthetics.

TETRACHLORIDE OF CARBON.

The tetrachloride, or, as it was formerly called, bichloride of carbon, is the highest of a series of chlorides of four grades. Recent experiments indicate this agent to possess valuable anæsthetic properties. It has an agreeable, delicate odor, somewhat resembling that of the quince, and when inhaled imparts a sensation of coolness to the throat similar to that experienced in drawing in one's breath after taking peppermint. Its anæsthetic effects are very rapid, and consciousness is speedily restored after its use.

Experiments upon the lower animals indicate that, when pushed to extremes, it destroys life by causing arrest of the circulation of the blood through the lungs.

Notwithstanding all that may be claimed for these new anæsthetics, their relative value and safety can only be determined after an extended series of experiments and observations.

LOCAL ANÆSTHESIA.

The danger attending the inhalation of the vapors of anæsthetic agents led to the introduction of what are known as local anæsthetics. Various means have been tried, among them the application of the electro-galvanic current; one pole of the battery being attached to the forceps, and a connection with the other held in the hand of the patient.

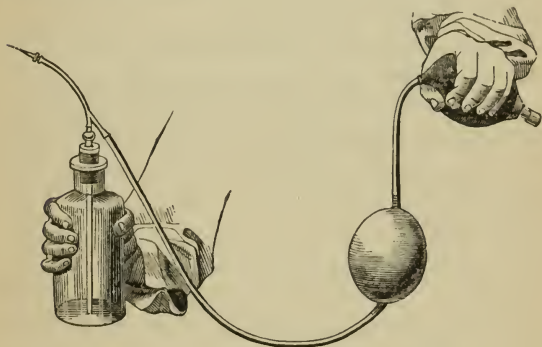
Various local applications upon the tooth and surrounding gum have also been tried for the purpose of obtunding sensibility previous to extraction. For this purpose equal parts of chloroform and tincture of aconite root have been recommended; but as this last is a very dangerous agent, it must be used with great care. By some practitioners a solution of camphor in ether is highly spoken of.

The following method of using chloroform or ether to obtain partial insensibility during extraction of teeth, has been tried, it is asserted, with success. The plan is to drop on the vertex from 10 to 30 drops of either of these agents, covering immediately with a folded napkin or handkerchief; an anæsthetic effect is produced, during which the tooth can be extracted. Should the application

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cause a painful sense of heat, the cloth can be partially or wholly removed.

More recently, the method invented by Dr. Benj. W. Richardson, of London, has come into general use. The process consists in directing on a given surface of the body, such as a tooth and the surrounding gum, a volatile liquid in minute subdivision or spray.



The apparatus consists of a bottle to contain the ether or other fluid to be used; through a perforated cork a double tube is passed, one extremity of the inner part of which goes to the bottom of the bottle; above the cork a tube, connected with the bellows, pierces the outer part of the double tube, and communicates by a small aperture at the inner end of the cork with the in-

the spray will be required until the excavation is completed.

The spray has also been used with success in the treatment of periodontitis, thrown upon the affected tooth and surrounding gum. It is not considered necessary to carry the freezing process to the extent required for extracting teeth, but the application should be longer continued.

It has also been successfully applied to check undue hemorrhage following extraction, and as a means of affording at least temporary relief in severe local pain, especially in cases of neuralgia.

To obviate the disadvantages of local anæsthesia applied to operations in the mouth, the attempt has been made, with considerable success, to produce the anæsthesia required by the application of the spray along the course of the tri-facial nerve outside of the mouth.

For use in this manner, some prefer concentrated ether, others consider rhigolene as more sure and more easily controlled, and some advise a mixture of the two in equal parts.

The concentrated ether is the officinal *Æther Fortior*; but for this purpose it should be very carefully freed from alcohol and water, which interferes with the success of the process.

Rhigolene is one of the most volatile products obtained by the distillation of petroleum. It is

the lightest of all known liquids, its specific gravity being 0.625. It boils at 70° F.

Local anæsthesia by cold, produced in this manner, has been used with great advantage in minor surgery; but if too long protracted, or over too large a surface, serious results may ensue.

Rhigolene is highly esteemed as a topical application in periodontitis. It is applied on cotton to the gum after free scarification,—its extreme volatility rendering frequent renewal necessary.

Rhigolene and ether, being extremely volatile and highly inflammable, should be kept securely corked and in a cool place, and not opened or used near a flame.

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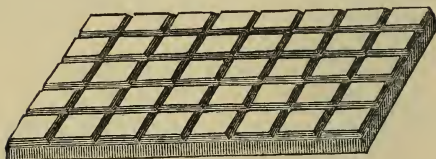
ASTRINGENT MOUTH-WASH.

This wash is intended for Office use, and for sale to patients; combining Anodyne, Astringent, Disinfectant, Detergent, Tonic, and Styptic properties. May be composed of Chlorate of Potassa, Tincture Krameria, Tincture Myrrh, Tincture Opii Camph., Tincture Cinchona Comp., Tincture Quillai, Ol. Rosa. It may be used with or without the brush, in its full strength or diluted with water, to cleanse the teeth or as a wash for the mouth.

Put up in neat 3 oz. bottles, and labeled without the manufacturer's name.

Price	per dozen	\$3 75
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DR. I. W. LYON'S TOOTH-TABLETS.



A NEW AND IMPROVED FORM OF TOOTH-POWDER.

Unlike the Tooth-powders commonly in use, this article is made into neat, portable cakes, divided into little tablets each of the right size for use, not liable to scatter or be wasted, and therefore very convenient, especially for Travelers. There is no occasion for dipping the brush into the box, thereby soiling what is not used, but a single tablet, enough for one brushing, may be broken off and put into the mouth; thus, several persons can use from the same box with perfect neatness and propriety.

It is made of the materials that were most approved of in the discussions of the American Dental Association at their Annual Convention, and is believed to be the best preparation yet produced for the teeth and gums. It has received the hearty approval of many leading dentists, to whom the formula has been submitted.

Price, per dozen boxes \$4 00

A larger discount by the Gross. A liberal discount to the trade.

Retails at 50 cents per box.

SUPERIOR TEETH-BRUSHES.

Manufactured Expressly for the Dental Trade.

We offer to the Profession a large variety of three, four, and five-row Brushes of the very best quality of material and workmanship. For convenience in ordering, we have had them put up in assorted dozens—each Brush differing in style. The Brushes being numbered on the Handles, enables the Dentist or Dealer to select such styles as he may wish to order.

Three-row Children's Brushes . . .	per doz.	\$2 60
Three and four-row “ . . .	“	3 60
Five-row Brushes . . .	“	4 60

In addition to the above, an extensive stock of Imported Brushes, three, four, and five rows, at prices ranging from 75 cents to \$5.00 per dozen.

GLASS BOXES AND JARS,

FOR

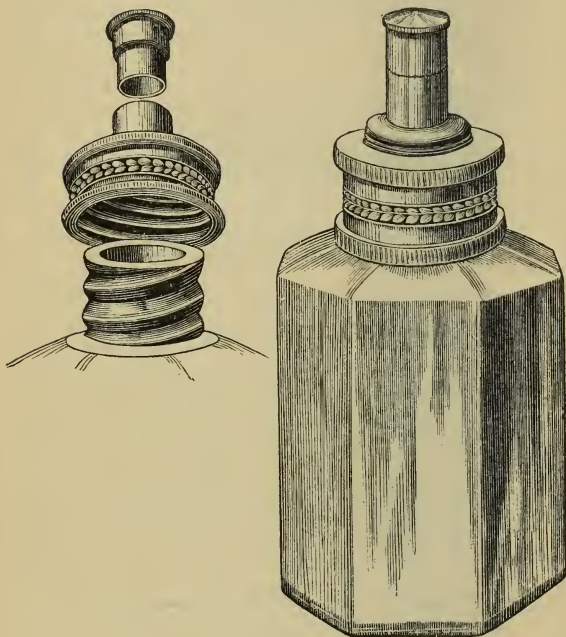
TOOTH-POWDERS AND PASTES.

<i>White Enameled or Pearl Color Boxes, with Britannia Covers</i> (we do not keep the zinc covers). $2\frac{3}{4}$ inches in diameter by $1\frac{1}{8}$ inches high. Per dozen . . .	\$1 25
<i>Semi-transparent Boxes, all glass.</i> $2\frac{1}{4}$ inches in diameter by 1 inch high. Per dozen . . .	1 00
<i>White Enameled or Pearl Color Boxes, all glass.</i> $2\frac{1}{2}$ inches in diameter by $1\frac{1}{4}$ inches high. Per dozen . . .	1 25
<i>White Enameled or Pearl Color Boxes, all glass.</i> 3 inches in diameter by $1\frac{1}{4}$ inches high. Per dozen . . .	1 50
<i>White Enameled or Pearl Color Boxes.</i> 3 inches square by 1 inch high, for pastes. Per dozen . . .	2 00
<i>Semi-transparent Glass Jars, with glass covers.</i> 3 inches in diameter by 3 inches high (called 6 oz.), for pastes or powders. Per dozen . . .	2 25
<i>Gilt Rim, White Enamel, Round Glass Box.</i> $3\frac{1}{4}$ inches in diameter and $1\frac{3}{4}$ inches high, each Box weighing 12 ounces. Per dozen . . .	5 00

These boxes are of the best quality Pittsburg and New England glass. We are prepared to furnish them by the dozen, gross, or in original packages.

We call attention to a new form of
TOOTH-POWDER BOTTLE.

Patented Nov. 19th, 1867, by Dr. J. B. Da Camara.



The Bottle has a silver-plated metallic Cap, which is retained by a thread on the neck, and is easily removed to fill the Bottle.

The Tube in the centre allows the nice distribution of the powder on the brush, and is closed by a neatly fitted sliding Cap.

This convenient manner of keeping Tooth-powder meets with general favor It avoids waste, can be readily carried when traveling, retains

the fragrance of the powder, and several may use from the same bottle with propriety.

PRICE.

Glass bottle and cap (as per cut), without boxes, per doz. . \$2 70

Glass bottle and cap (as per cut), without boxes, filled with
S. S. White's Tooth-powder, No. 1, per doz. . . . 4 00

Glass bottle and cap (as per cut), with elegantly finished
round boxes, gilt rim, size of bottle, per doz. . . . 3 25

Glass bottle and cap (as per cut), with elegantly finished
round boxes, gilt rim, size of bottle, and filled with
S. S. White's Tooth-powder, No. 1, per doz. . . . 4 60

Dentists can affix their own labels.

ANATOMICAL PREPARATIONS.

We have just received from Paris a new lot of the following preparations:

First and Second Dentition, Upper and Lower Maxilla
(mounted), with Vase \$15 00

Upper and Lower Maxilla, exhibiting Nerve and Artery on
one side, and Artery and Vein on the other, Jaw carved
and Teeth split to show the Nerve Cavity (mounted),
with Vase 30 00

Section of Head, showing distribution of Fifth Pair of
Nerves, connected with Teeth and Jaws (mounted),
with Vase 50 00

Head, showing first and second Dentition (mounted), with
Vase 30 00

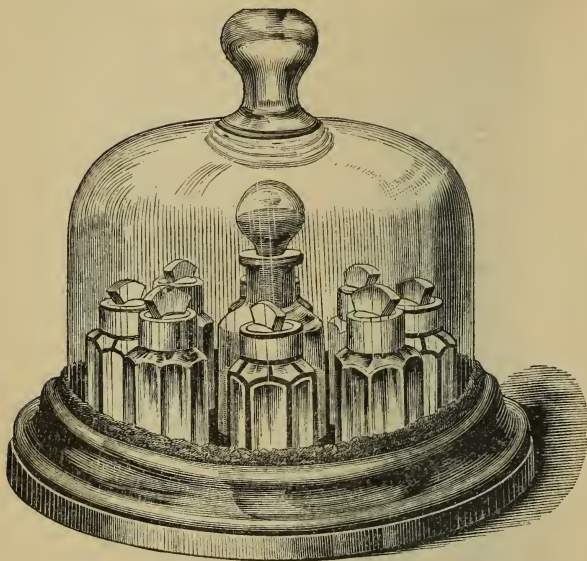
Comparison of the Angle of the Lower Jaw in the Infant,
Adult, and Old Age (mounted), without Vase 9 50

Comparison of the Arch of the Upper Jaw in the Infant
and the Adult (mounted), without Vase 9 50

Skulls, No. 1, with extra perfect articulation . . . 16 00

“ “ 2 12 00

STAND FOR OFFICE PREPARATIONS.



This is intended for the clean and convenient keeping of Dental Polychrests, such as Carbolic Acid, Iodine, etc. The Base is of wood, highly polished, $7\frac{1}{2}$ inches in diameter, $1\frac{1}{2}$ inches high. Vase of fine glass, 6 inches in diameter, $6\frac{3}{4}$ inches high, containing 8 cut-glass bottles with ground stoppers, and a drop bottle in the centre. Chenille around the Vase.

Price \$6 00

HAND-MIRRORS, JUST IMPORTED DIRECT FROM PARIS.

Rosewood and Satinwood, Bevel-edge, Plate Glasses, extra finished, assorted sizes, prices ranging from \$2 25 to \$3 00 each.

DROP BOTTLES.



These bottles are very convenient for using Iodine, Creasote, Acids, etc., in the office. Warm the bulb over the flame of a spirit-lamp or in warm water, in order to expand the air; then immerse the point in the liquid desired, and it will slowly ascend into the bulb as the air is condensed. This should be done in a wide-mouth bottle or cup, as, if placed in the bottle to which it belongs, it is apt to crack by the unequal expansion in the neck.

When perfectly cool, it may be placed in the bottle, which should contain at least enough of the liquid to cover the point and prevent its contents from dropping. When desired for use, the warmth of the hand applied to the bulb will force the contents out a drop at a time.

The advantages of this little contrivance, in the readiness with which it may be used, its cleanliness, etc., will be apparent to all.

Price each 25 cents.



CREASOTE APPLIANCE.

Intended to prevent fluid caustics, such as Creasote or Solution of Nitrate of Silver, from running down and cauterizing the lips when being applied to the gums. The Cut shows the size of the Instrument. A Spiral Platina Wire, two inches long, is inserted in a Handle, passing through a small piece of Sponge, over which is a Glass Tube one and a quarter inches long. The Tube slides over a part of the Handle to keep it firm, and to hold the Wire in the centre. When the caustic is taken up on a small piece of cotton, if any should run down, it is caught in the Tube \$0 75

SYRINGES.

Gold, extra heavy, 18 carats fine, two Pipes . . .	\$30 00
Silver, two Pipes	7 50
Coin Silver, small size, Electro-gilded, with two Pipes, a beautiful article	7 50
Silver-plated, two Pipes	4 00
Glass, Silver-mounted, beautiful and cleanly . . .	4 50
Britannia, Silver Pipe	1 00
“ German Silver Pipe	0 63
Vulcanized Rubber	1 00
“ “ Silver Pipe	1 50
“ “ 18-carat Gold Pipe	3 50
* “ “ Small, Gold Pipe, for injecting Iodines and Acids into Abscesses	6 00
* “ “ Small, with Steel Pipe, subcutaneous	4 00
* Glass, small, with Steel Pipe graduated, subcutaneous	5 00

* Inclosed in neat Morocco Cases, convenient for the Pocket, and protecting the Syringe.

ELECTRO-PLATED ELASTIC BULB SYRINGES.



Price \$2 50

IMPROVED ELECTRO-GILT SYRINGES, WITH ELASTIC BULB.



A SUPERIOR ARTICLE.

Price \$3 00

DENTISTS' NAPKINS.

Fine quality, all linen, Damask Napkins, $6\frac{1}{2}$ inches square, per doz. \$1 00

Damask Napkins, $12\frac{1}{2}$ by $11\frac{1}{2}$ inches, cut and fringed " 1 75

" " 12 inches square " 1 50

Also, for the mouth, in square and oblong pieces, stitched to prevent raveling, the following varieties, made of fine Bird-eye Diaper :

Square, $3\frac{1}{4}$ inches per doz. 40

" $5\frac{1}{2}$ " " 80

Oblong, 4 " by 7 inches " 80

Also, fine Bird-eye Diaper Napkins, hemmed, $10\frac{1}{2}$ in. sq. " 2 00

Extra " " " $10\frac{1}{2}$ " " 2 75

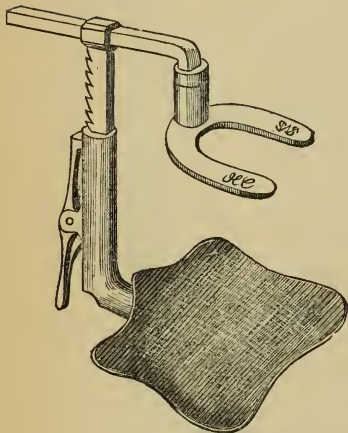
" " " $16\frac{1}{2}$ " " 5 00

TONGUE-HOLDER

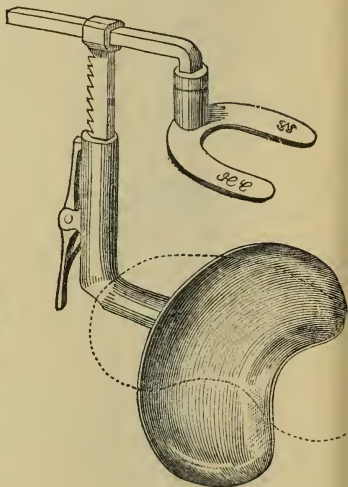
AND

DUCT-COMPRESSOR.

No. 1.



No. 2.



For this modification of a very useful instrument, we are indebted to DR. P. T. SMITH, of Tipton, Iowa, from whom we have received the following complimentary notice: "I cannot too highly compliment its mechanism both for strength and beauty; and after giving it a trial, I can offer no suggestions for its improvement, but do cheerfully and earnestly say that one of *your make* should be in the hands of every Dental operator."

By its use the tongue may be clamped down in place and kept in position as long as desired. The sublingual and submaxillary ducts may be very effectually closed by placing upon them rolls or pads of bibulous or tissue paper before applying the Compress; a pad of paper or a napkin

should be placed on the tongue before applying the instrument. The use of it is a relief to patients rather than a discomfort, holding the tongue entirely out of the way during an operation, without requiring a constant effort on their part. It possesses all the advantages of the Hawes Compressor, and the additional convenience of a lateral and sliding motion of the Compressor and a lateral motion of the Chin-plate, by which the Post can be placed at either side, out of the way of the operator.

The Chin-plate of No. 1 is 2 inches long by $1\frac{3}{4}$ inches wide.

The Chin-plate of No. 2 is $2\frac{1}{2}$ inches long by $1\frac{1}{4}$ inches wide.

The stationary part of the Post of both is $1\frac{3}{8}$ inches long, and can be extended to $2\frac{3}{4}$ inches by the Ratchet and Stop.

The Compressor has a sliding motion of $1\frac{7}{8}$ inches.

PRICE.

BRASS, SILVER-PLATED.

No. 1, chin-piece concave, shield-form, padded with velvet	\$5 00
No. 2, shaped to fit the chin front or sideways, plain burnished	5 00
With both patterns of chin-plate	8 00

GERMAN SILVER, SILVER-PLATED.

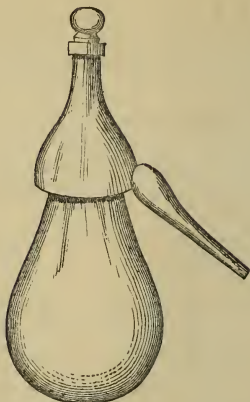
No. 1, chin-piece concave, shield-form, padded with velvet	6 00
No. 2, shaped to fit the chin front or sideways, plain burnished	6 00
With both patterns of chin-plate	9 00

NITROUS OXIDE GAS APPARATUS.

Illustrated on page 98.

Complete Apparatus, 40 gallons' capacity	\$65 00
“ “ 50 “ “	70 00
Boxing (additional)	2 50

RETORTS.



Tubulated Retorts, flint glass, half gallon, of shape illustrated. Made expressly for our sales, and highly spoken of by those who have used them for manufacturing Nitrous Oxide.

Price \$1 50

THERMOMETERS

TO INDICATE THE HEAT EMPLOYED IN MANUFACTURING NITROUS OXIDE.

They are intended to be passed through the Cork and into the Retort. They are marked with the following degrees: 226°, 356°, 460°, 482°, 500° F.

Price \$1 50

DR. D. H. GOODWILLIE'S

INHALING APPARATUS,

FOR ADMINISTERING

All the Anæsthetics, Medical Vapors, etc.

DESCRIPTION.

a. Bottle loosely filled with a sponge.
b. Tube passing to the centre of the sponge, conveying air.

c. Tube conveying the vapor from the bottle.

A. Faucet, containing the inhalation and exhalation valves and air-passage, and revolving one-sixth of a circle.

C. Face-piece, fitting over mouth and nose, with a flexible border.
 (Two sizes.)

FIG. 2.

Faucet with the valves.

h. Inhalation valve, for the passage of the vapor.

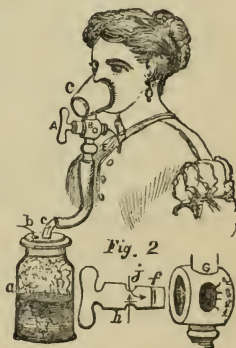
f. Exhalation valve, for the breath to pass out.

j. Passage for the vapor in inhalation and the breath in exhalation.

g. Fresh-air passage, with an index to show the quantity of vapor or air being inhaled at any given time.

The relative proportions of vapor and air are changed by the revolution of the faucet *A* over the inhalation valve *h*, Fig. 2, and the air-passage *G*, Fig. 2. These proportions are shown by the index at *G*. Thus revolving from 1 to 4 increases the vapor, and in the same proportion decreases the air from 4 to 1, *vice versa*. 1 is the minimum amount of vapor and the maximum amount of air; 4 the maximum of vapor and minimum of air.

When the patient inhales, the air passes into the bottle at *b*, causing the liquid to evaporize on the upper half of the sponge, and passing out at *C* into the inhaler to be inhaled, the amount of vapor or air being



regulated by the revolution of the faucet over the inhalation valve and air-passage.

The bottle should never be more than half full, so as to allow evaporation on the upper half of the sponge.

A flexible border is stretched over the face-piece for children, or inhalation by the nose only. For the administration of nitrous oxide, the inhaler can readily be applied by connecting it to the gasometer or bag instead of the bottle.

The value of this Inhaling Apparatus consists in—

1st. *Its safety.* Air is at all times inhaled with the vapor, producing good anæsthesia without asphyxia. It is under the complete control of the anæsthetist.

2d. *Efficiency.* The gradual inhalation of the vapor produces less spasm of the epiglottis (coughing), struggling, or sickness. Anæsthesia is quietly produced and maintained. Rapid recovery from the anæsthetic.

3d. *Economy.* As all the vapor must pass from the bottle to the lungs, there is consequently no loss of the anæsthetic, and little or no smell of ether in the room. A saving of two-thirds of ether or chloroform over the old way of administering.

4th. *Simplicity.* Consisting of an inhaler (mixing vapor and air at will) connected to a bottle from which the anæsthetic is inhaled.

5th. *Cleanliness.* As the apparatus is made of hard rubber and glass, it is readily kept clean.

From a record of 50 cases of anæsthesia kept at Bellevue Hospital, the following is the result: Three (3) ounces of ether will produce anæsthesia and sustain it for one-half hour in an adult. This is the average of the above 50 cases. Slight sickness in four cases, but did not interrupt operation.

Improved Inhaler, with two Face-pieces of different sizes (as

per Cut described in our Catalogue, page 145) . . . \$10 00

Apparatus Complete, in Boxes or Leather Bags . . . 18 00

FUSED NITRATE OF AMMONIA.

Manufactured expressly for our sales. Best quality. Put up for convenience in Wood Boxes, containing 5 and 10 pounds each.

In original packages, Box included . . . per pound \$0 65

When ordered by Dentists in lots of 50 pounds, a discount of 10 per cent. will be allowed.

NOTICE.

PRESENT PRICES OF GOLD FOIL.

S. S. WHITE'S, \$44.

S. S. WHITE'S "Hastings," } \$42.00 per ounce.

S. S. WHITE'S "Eakins," }

Watts', Abbey's, and Atkinson's, at manufacturers' current rates.

Present price of each (July 15th), \$48; Watts', No. 2, \$50.

The prices of Foils vary with the premium on Gold.

COMPOSITION FILLINGS.

(When sent by mail, postage extra.)

S. S. White's Gutta-percha Filling, No. 1 (postage 6 cts.), per ½ oz.	\$1 50
“ “ “ No. 2 “ “ “ “	1 00
Hill's Stopping, in oz. and ½ oz. packages (postage 9 and 6 cents),	
per oz.	5 00
Artificial Dentine (Bevin's) (postage 6 cents), per ½ oz.	2 00
Roberts' Os Artificiel (postage free) per box	1 00
“ “ “ “ “ Gum Color, per box	1 00
Oxychloride of Zinc (postage 45 cents), 1 oz. package	4 00
“ “ “ 24 “ ½ “	2 00
“ “ “ 15 “ ¼ “	1 00
Lawrence's Amalgam “ 9 “ per oz.	3 00
Townsend's “ “ 9 “ “	2 00
Luther's “ “ 9 “ “	3 00
Walker's Excelsior Amalgam (postage 9 cents), per oz.	4 00
Arrington's New “ “ 9 “ “	4 00

S. S. WHITE'S

GUTTA-PERCHA FILLING.

After considerable experimentation, we are now ready to offer

A SUPERIOR ARTICLE OF

PREPARED GUTTA-PERCHA,

TOUGH AND DURABLE,

FOR FILLING TEETH.

There are two varieties: No. 1, light colored and strong, suitable for cavities in front teeth; No. 2, darker colored, and well adapted to cover temporarily applications for sensitive dentine and for devitalizing pulps. Put up in *half*-ounce packages.

Price per Half-ounce Package, No. 1	\$1 50
“ “ “ “ No. 2	1 00

A LIBERAL DISCOUNT TO DEALERS.

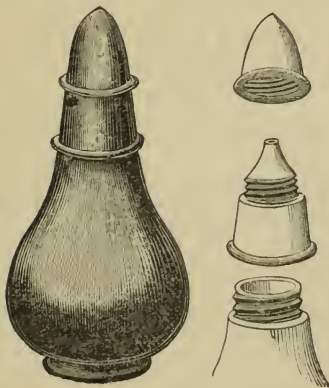
FRENCH RUBBER TUBING.

Just received, a new importation of assorted sizes best French tubing, for Dental purposes.

Per foot, all sizes	\$0 20
-------------------------------	--------

DOUBLE-TOP MERCURY HOLDER.

FOR CONVENIENT PREPARATION OF AMALGAM.



The Cut represents the size of the Holder, which will contain one and a half ounces of Mercury. It has two apertures, one for filling the Holder with Mercury, and the small opening to allow it to escape in a fine stream. The Cap prevents the escape of the Mercury.

Holder, of ebony or boxwood, nicely polished	. . . \$0 35
“ filled with Redistilled Mercury	. . . 50

COFFER-DAM RUBBER.

A large supply of this popular article.

Per yard \$3 00
“ ounce (Troy) 50

INSTRUMENTS.

In the manufacture of Dental Instruments, our facilities are not surpassed by any establishment in the country. We import the best quality of Steel in large quantities, made to order in special shapes and sizes, expressly for our use; procure Ivory, Ebony, Pearl, Cameo, and fancy Woods direct from first hands; have secured skilled workmen in each department connected with their manufacture; provided machinery peculiarly adapted to the work, and are thus enabled to furnish the finest quality of Instruments at moderate prices. Being made under our own supervision, we guarantee their quality, and invite comparison with those of other manufacturers.

Prof. J. TAFT, in the April number of the *Dental Register*, uses the following language in reference to our Instruments:

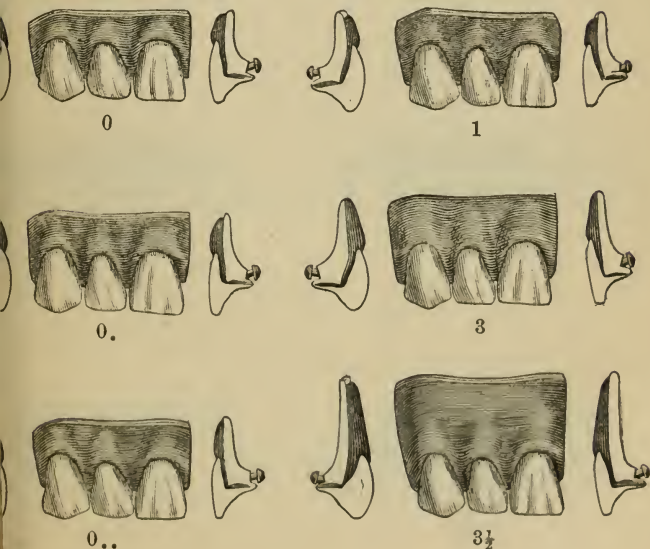
"It is with pleasure that we call attention to the fine serrated plugging instruments now manufactured by S. S. WHITE. His aim has been to make these instruments in quantities sufficient to supply the demand; and equal in quality and perfection of form and finish to the highest execution and conception of a Palmer, Butler, or Abbott. This he has so well succeeded in doing as almost to defy criticism. We have been using these instruments for a time with a view of testing them, and we are compelled to say that they are far superior to anything we have used before. The forms are very much improved and the serrations most perfect. With such instruments it is a pleasure to fill teeth.

"We trust that the plugging instruments to which we have referred will be tested by every one who desires to make good operations. Perfect instruments lead one on to improved operations."

ILLUSTRATIONS OF SECTIONAL TEETH.

The following illustrations of a few of the different sizes and styles of sectional teeth are presented, with a view of enabling dentists practicing in cities and towns remote from dental depots to order, with some degree of certainty, style, sizes, and shapes of teeth adapted to particular cases on hand. The numbers attached to the cuts are the same as are moulded on the reverse of the blocks. A much more extended catalogue of forms and sizes will shortly be published.

We are indebted for this method of delineating forms of blocks to Mr. Charles J. Essig, of Baltimore, Md.





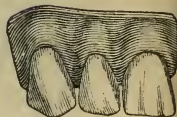
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30 $\frac{1}{2}$



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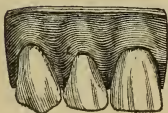
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31 $\frac{3}{4}$



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33



33 $\frac{1}{4}$



46



33 $\frac{1}{2}$



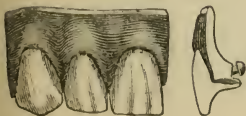
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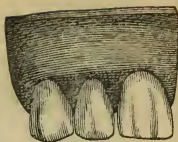
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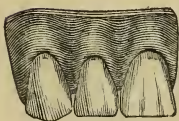
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67 $\frac{1}{4}$



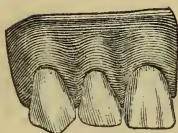
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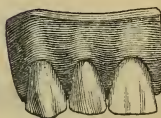
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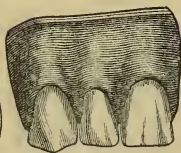
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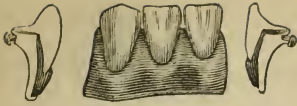
71 $\frac{1}{4}$



69 $\frac{1}{4}$



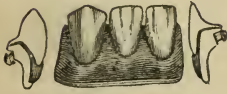
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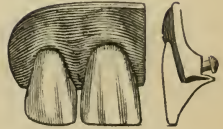
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33



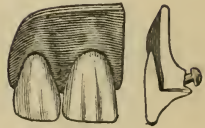
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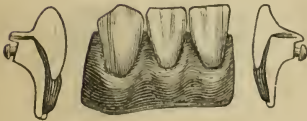
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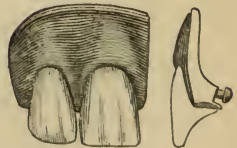
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65 $\frac{1}{4}$



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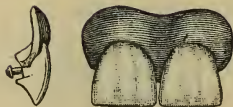
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18

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the Dental Library by the last
date stamped below. It may
be renewed if there is no
reservation for it.

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H.R. Abbott

Mem. Lib.

Author White, James W.

Title Dental Materia Medica

Harry R. Abbott Memorial Library

FACULTY OF DENTISTRY

TORONTO

